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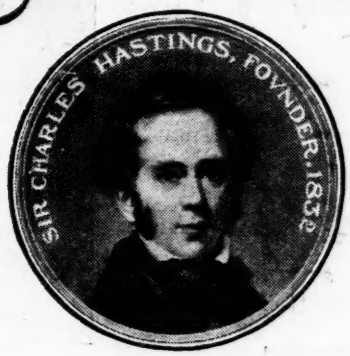

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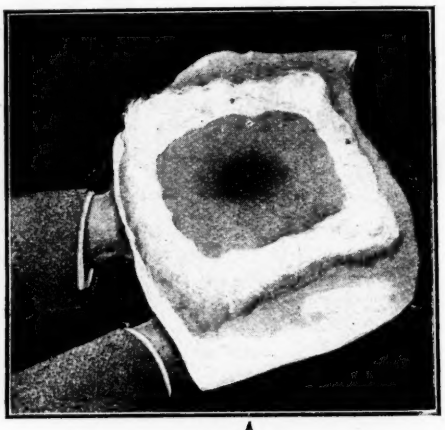

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An Address
ON
THE INDICATIONS FOR, AND LIMITATIONS OF, SURGERY IN CHRONIC ABDOMINAL DISEASE.*

BY
JAMES SHERREN, C.B.E., F.R.C.S.,
SURGEON TO THE LONDON HOSPITAL, ETC.

IN speaking of the indications for, and limitations of, surgery in chronic abdominal disease I am using the word "surgery" to mean operative surgery—in itself a limitation, as this form of treatment involves the removal of organs or parts of organs, their drainage, short-circuiting, or fixation. We appear to have reached a stage at which operative technique has progressed more than diagnosis, and treatment is often in advance of, and may be more severe and dangerous than, the "disease" for which it is recommended.

Surgery, of course, is not so limited and cannot be divorced from medicine. The surgeon needs to be a physician, and it rightly falls to his lot to suggest and supervise courses of treatment other than operative. At the present time, however, most patients are sent to him when rest, diet, and drugs have failed to relieve, to see if by his art he can remove the cause *of the symptoms* or in some way alter the relationships of organs that it ceases to act.

Our aim should be to discover the cause *of the disease*, and so prevent the development of lesions necessitating for their treatment mutilating operations, such as removal of the gall bladder, spleen, portions of the stomach or intestine. We know that long life in comfort and perfect health is possible after all these procedures, but he would be a bold man or surgeon who would assert that the patient who has lost portions of his internal anatomy or whose internal physiology was altered by short circuits is in no way worse off than one not so treated, although we know that he is infinitely better off when disease has been cured or relieved by these means.

It may be with us surgeons as with the sailors of the last century. When the art of building sailing ships and sailing them reached its zenith, so the need for these arts declined, and is now almost lost. It is possible that operative skill will become similarly unnecessary, except in dealing with the result of accidents.

We should not be obsessed with the idea that there must be an operative cure for all abdominal ills, and allow the fact that many abdominal operations can be done at small risk and with little discomfort to lead us to perform or advise operations on speculative grounds.

There is no doubt of the necessity of operation at the present time in dealing with many forms of chronic abdominal disease. In malignant disease its localization is an indication, its secondary deposits a limitation. Although we are still ignorant of its cause, I have no doubt that in the abdomen its onset may be prevented in many cases. There is a preventive surgery as well as a preventive medicine. Timely appendicectomy will, I am convinced, anticipate the development of many ulcers of stomach and duodenum and disease of the gall bladder; but the appendix must be a diseased one—wholesale removal of this organ in cases of visceroptosis, sacro-iliac strain, etc., only brings surgery into disrepute. The early and efficient treatment of acute gastric ulcer may hinder its change into the chronic type, and early operation on the latter will certainly prevent later malignancy. Similarly, removal of the diseased gall bladder will do away not only with the risk of recurrence of gall stones, when undertaken in cases with this complication, but the possibility of the later development of carcinoma—a risk by no means negligible following cholecystostomy. Drainage of the gall bladder is not curative; all sufficiently diseased to need operation need removal, and there is no more satisfactory operation in surgery that can be undertaken at so slight a risk.

It is essential that diagnosis precede treatment, although that diagnosis may not be made until the abdomen has been opened, but no lesion diagnosed then on symptoms only should ever be treated by surgical procedure; no organ should ever be removed or any mechanical alteration made except for disease that can be definitely recognized—never for symptoms thought to be attributable to a certain organ.

Although diagnosis may be impossible until the abdomen has been opened, every endeavour must be made, by every method at our disposal, to come to a pre-operative decision as to the cause of the symptoms. We must at any rate be able to say, Surgery will benefit this patient; there is a lesion here that needs operative treatment. It should not be a case of look and see if anything can be done. We should blush to find on opening the abdomen that no demonstrable lesion is present.

In abdominal surgery attention must not be directed only to the organ thought to be at fault; the viscera have interrelationships. When operating for chronic disease the whole abdomen must be explored, and the exploration must be thorough. I have frequently given examples of this and have often had to operate on patients with disease of the gall bladder, stomach, or duodenum in whom I have been informed that this was absent because an incision had been made, the appendix removed, and these organs investigated by touch. It cannot be said too often that disease of the gall bladder—including one of its results, stones—cannot always be diagnosed by touch, and it is often necessary to open it and inspect, even to discover these. Only last week I operated on two patients; in both the gall bladder to the onlooker looked healthy. In one there was thick bile, cholesterin deposits in its mucous membrane, and polypoid cholecystitis; in the other, stones that could not be felt externally. If I suspect gall-bladder disease I always open it and investigate.

Again, how many ulcers of the duodenum or stomach is it possible to feel with the tips of the fingers from below, and how many are missed through making a small incision and exploring digitally? Surgeons should not limit themselves in this way. We used to pride ourselves on being able to remove an appendix through an inch incision; it can be done, but is not surgery.

In treating chronic gastric and duodenal ulcer we should remember that we are dealing with the end-result of disease of which we can at present only discern dimly the cause. The future treatment I believe will not be operative; its indication now is failure to cure or alleviate by medical means. This includes treatment of all foci of infection—rest in bed, diet, etc.; when all these fail surgery is indicated. We must realize that this necessarily involves interference with the physiology of digestion, whether the operation is a short circuit or removal of a portion of the stomach. Operative success in treatment is impossible without altering normal relationships, and the human organism has to adapt itself to it, and does so very well.

Each disease has its own dangers, and operation is indicated on failure of medical treatment because of the grave risk in chronic gastric ulcer of the development of carcinoma, of haemorrhage and less, of perforation. The risk of the development of carcinoma is a very real one. It is no uncommon thing to find on operating on patients with long standing histories pointing to gastric ulcer that carcinoma has supervened and is now beyond the skill of the surgeon. I have found, in a fairly extensive operative experience, that in at least 45 per cent. the carcinoma has followed on chronic gastric ulcer. Others put the figure much higher. Haemorrhage from *chronic* ulcer is a complication second in severity only to perforation, and one that should be prevented by timely surgical intervention. When it has occurred, operation should be carried out so soon as the condition of the patient will admit. I like to do it within twenty-four hours of the first attack. Many of these resemble secondary haemorrhage, with which you were unfortunately so familiar during the late war; after a warning there is a latent period followed by haemorrhage which not infrequently continues to a fatal issue. I am speaking now of haemorrhage in patients suffering from chronic ulcer—that is, in those with a long-standing history of attacks of indigestion separated by periods of health. It does not apply to haematemesis arising in some cases from acute ulcers, that can be conveniently grouped under the heading of gastrostaxis. These do not need operative treatment. We must not, however, let ourselves be hypnotized by such a word, but always be on the lookout to recognize the cause in each case, and remember that an acute haematemesis is sometimes the first symptom of carcinoma of the stomach and the first symptom attracting attention in splenic disease amenable to surgical treatment.

Operation is advisable in chronic duodenal ulcer, because of the great risk of perforation and haemorrhage. All who have had much experience in the treatment of this grave disease will recall instances in which perforation occurred during a period of latency, between the attacks, when the

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*Given at the Annual Meeting of the Suffolk Branch of the British Medical Association on June 30th.

patient considered himself well. No one with this disease, whatever precautions he may take, can consider himself safe from this complication. In many patients the attacks may not interfere much with their life, but it is the risk that makes me advise operation in every case that has resisted efficient medical treatment.

After operations for chronic gastric or duodenal ulcer, notwithstanding altered relationships, the patient is relieved in the majority of cases, and in 90 per cent. is cured, whether the treatment applicable has been posterior gastro-jejunostomy or partial gastrectomy. Failures there must be in everything in this life, in surgery as in all other mundane affairs; these are our limitations, and are mostly due to the impossibility of discovering a still active causative agent, and the recurrence of ulceration in the region of the new opening after operation for chronic duodenal ulcer, or, in still rarer instances, to mechanical changes which may arise in the region of the anastomosis due to the formation of adhesions and resulting in vomiting.

The indications for removal of the appendix are obvious in chronic disease of the type associated with attacks of general abdominal pain with tenderness in the right iliac fossa. It is in these cases that it is justifiable to operate through a small muscle-splitting incision.

It is still necessary to remonstrate against removal of the appendix for pain confined to the right iliac fossa or right side of the abdomen; this is still being diagnosed as due to the appendix, and this organ is being removed without success in its treatment. Hardly a week passes in which I do not see patients in whom this operation has been done unnecessarily and unsuccessfully. Appendicectomy is now so safe that there is very great danger of it being carried out indiscriminately for discomfort rather than for disease and after insufficient investigation. A pain in the right side and tenderness on palpation are not sufficient justification for operation.

It is at present one of our limitations that we have not discovered a satisfactory cause for many of the pains in the right iliac fossa, met with particularly in women. Kidney diseases, ovarian tumours and tubal disease, atony and prolapse of the caecum, intestinal stasis may all be considered responsible, and if due to the first three groups can be cured by surgical means; it is doubtful, however, if this is possible with the remainder; in the majority of these we cannot discover any really satisfactory cause. All, however, need the closest investigation, and care must be taken not to overlook pain due to disease of the kidney and to chronic obstruction, particularly in the pelvic colon, in which the pain may be confined to the right iliac fossa.

Removal of the appendix cannot be expected to cure disease of the gall bladder, stomach, and duodenum; yet how often do we see patients with obscure abdominal symptoms in whom the appendix has been removed through an incision which makes thorough abdominal exploration impossible. Our tactile sense will not diagnose early, and sometimes even late, conditions here. I have long taught, and will once again repeat it: You may diagnose appendix dyspepsia, you should never act on it—that is, you should never remove the appendix alone in these cases and wait for events, but examine every other abdominal viscus. These are the cases of chronic appendicitis in which it is not justifiable to operate through the muscle-splitting incision in the right iliac fossa. For example, last week I operated upon a male patient of 25 with a history of attacks of indigestion for four years, whom I had been asked to see as a case of appendix dyspepsia. The report of the barium meal was a normal stomach; his test meal gave normal gastric acidity. I removed a thickened appendix becoming obliterated at its distal end and then prolonged the incision upwards. I found a chronic ulcer on the lesser curvature about an inch from the pylorus. This is the most recent example, but I have had a similar experience on many occasions, on more have had to reoperate after others, and have found not only chronic ulcers and gall-bladder disease, but even carcinoma of the stomach, after the appendix had been removed on the diagnosis of appendix dyspepsia.

It is one of the limitations of abdominal surgery at the present time that it is impossible to exclude disease without examining by sight and touch the suspected organs. When abdominal symptoms are present they may be definite enough for us to say they are due to disease of the gall bladder, the duodenum, the stomach, or the appendix, but we cannot say that there is no disease in either of the other organs without looking. In the type of case, by no means uncommon, in which, in spite of every method of investigation, we are uncertain of our diagnosis, all have equally to be examined. Our limitations will be fewer if we remember that the days of small incisions are over. If a paramedian incision is used, pulling the rectus out its length does not matter. I would remind you that in chronic abdominal disease the organs with which we have to deal are situated principally to the right of the mid-line, yet I still see patients who have had a "gastro-jejunostomy" performed or even an exploration carried out through a left-sided incision.

When dealing with the colon one enters at once into a region where there has been and still is fierce controversy. We are, however, on absolutely solid ground when we give as an indication for surgical treatment the removal of portions of the colon that are so diseased as to be incapable of performing their function. The operative surgery of malignant disease here, as elsewhere, has its limitations in spread of the disease outside the limits of the organ; the problem of treatment consists in removing sufficient bowel together with its lymphatic area of drainage. In non-malignant conditions every endeavour should be made to conserve the colon, and, if excision is necessary, to remove as little as possible. In dealing with the caecum and ascending colon we must bear in mind that removal of the ileo-caecal valve profoundly alters intestinal digestion. Removal of the colon or its right half must interfere seriously with the functions of the alimentary tract. The colon is necessary in the human economy; it should never be removed unless its retention threatens life.

In chronic ulcerative diseases not cured by medical measures appendicostomy in my hands has given brilliant successes, but there are failures. In these I have brought up a coil of the ileum about a foot from the ileo-caecal valve and drained it so as to give the colon absolute rest, and not restored the continuity of the alimentary canal until examination of washings has proved the ulceration to be healed. Ileo-sigmoidostomy is useless in the treatment of ulcerative colitis; it is an operation that is rarely, if ever, justifiable; it does away with the action of the ileo-caecal valve, and does not prevent overfilling of the colon proximal to the anastomosis. If a short-circuiting operation is necessary in the treatment of irremovable carcinoma of the colon it should be colon to colon.

We come now to a group of cases with which all are familiar, under the term "visceroptosis." Much more often met with in women than in men, it is a continual source of invalidism, if not of real ill health. It is therefore not surprising that patients seek, and surgeons have endeavoured to find for them, relief by operative means. Many are the operations that have been devised and carried out: division of adhesions, plications, fixation of stomach and colon, even to colectomies, partial or complete, with, I believe, no more success than will attend a similar compulsory rest in bed. The more experience I have in abdominal surgery the less success do I expect from operation in these cases and the more loath am I to undertake it. We are driven to it sometimes by the limitations of our knowledge; it may be quite impossible to exclude other and more serious disease without exploration. Gall-bladder disease is common in this type of case. Chronic gastric ulcer high on the lesser curvature is not infrequent, and carcinoma may develop.

Always remember that it is not a disease that shortens life; carry out nothing that may do so. I believe many of these patients are suffering from disease of their autonomic nervous system—that the visceroptosis, the dropped stomach, atonic and prolapsed colon are not causes. They may all exist without producing symptoms, and those that occur cannot always be explained by their presence. Diagnosis has outrun treatment here. Surgeons were justifiably eager to seize upon these "misplacements," just as in earlier years displacements of the uterus were looked upon as the source of chronic ill health. From the experience we have gained in its surgical treatment I believe that in its management such operations as fixation of colon, partial colectomy, plication of caecum, will disappear.

We must realize our limitations here, while trying in every way to improve our methods of diagnosis. There are still pains and discomforts in the abdomen that cannot be removed with the appendix or by fixing viscera or dividing adhesions.

To pass now to the gall bladder. Here our limitations are less, as we are able to deal with the disease and not only remove its results. At the present time, only operation can demonstrate the condition of the gall bladder. I would again lay particular stress on the fact that until the gall bladder

has not only been seen but explored by opening, it is impossible to be certain that disease is absent. In the early stages of gall-bladder disease cure by surgery is sure and safe; in the presence of such complications as stone in the common duct and acute infections the risk becomes greater, and malignancy may be the termination of chronic simple gall-bladder disease.

When the gall bladder is diseased its removal is indicated—in two stages, if life or the integrity of the common duct is threatened if done in one. Drainage alone will not certainly cure, nor will it prevent the later onset of carcinoma in gall bladders believed, on external examination, to be healthy at the time of drainage, after removal of calculi. I have known it to arise from one to four years after drainage of what was considered a sufficiently healthy gall bladder to leave after the removal of calculi.

One of the most recent advances in abdominal surgery is that dealing with disease by splenectomy. Although we know that removal of the spleen is followed by restoration to health in suitable cases, until we are fully cognizant of its functions we cannot understand the part it plays in disease and why removal in certain cases is efficacious. That long life was possible after removal of the spleen in man we owe to clinical observation after splenectomy for injury. Interference next followed in such conditions as wandering spleen with torsion of the pedicle or the rare tumours. More recently, diseases of the spleen associated with blood changes have been successfully treated; I allude to such groups as splenic anaemia, Banti's disease, and splenomegalic jaundice. In the former, restoration to health occurs, and so far as we can ascertain no evil effects follow; we can justifiably speak of cure. It may be otherwise when operation is carried out in the later stage of the disease when cirrhosis of the liver has supervened. With this complication, when haemorrhages have taken place before operation, although apparent restoration to health is the rule, yet death from haematemesis at a later date is not unknown, in spite of the fact that splenectomy has been suggested as the treatment for certain cases of haematemesis in the absence of gastric or duodenal ulcer, splenomegaly, or recognizable hepatic cirrhosis. Our limitation here is due to neglect of treatment in the early stages of the disease.

Of the cause of the disease and the splenic enlargement, whether due to thrombosis—and if so, the infecting agent and its organ—we are in ignorance. Why removal of the spleen alters the blood picture is also beyond our ken. We are sadly limited in our dealings with diseases associated with splenic enlargement in not knowing their cause.

I know of no condition in which recovery is so dramatic as in splenomegalic haemolytic jaundice. In the familial type discoloration may have persisted from the early years of life, and yet within forty-eight hours of removal of the spleen it has disappeared. The fragility of the red cells, part of the disease, may be unaffected by splenectomy. As in other chronic abdominal diseases, general exploration has to be carried out, particular attention being paid to the gall bladder and ducts, as these cases are often complicated by pigment calculi.

Splenectomy in pernicious anaemia and in leukaemia is experimental, and until more evidence is forthcoming we should stay our hand.

Surgery has many legitimate triumphs in the abdomen. Let us see to it that it is not brought into disrepute by operations for trivial complaints, and that removal of the appendix or gall bladder, or fixations of the colon, do not become common procedures in every discomfort in this region.

PAIN IN GENITO-URINARY AFFECTIONS:

ITS VARIATIONS AND THEIR INTERPRETATION.

BY

W. K. IRWIN, M.D., F.R.C.S.EDIN.,

HONORARY CASUALTY OUT-PATIENT SURGEON, ST. PAUL'S HOSPITAL FOR GENITO-URINARY DISEASES.

THE variations of pain in genito-urinary affections are so numerous and often so misleading that their interpretation may be difficult. It is hoped that the following notes will facilitate the early recognition of the causes at work.

Pain arising in this system frequently shows itself in parts other than the seat of the lesion, and it may be well at the outset to emphasize the distinction between (1) *site pain*, which is felt in or over the lesion, and (2) *referred pain*, which through abnormal perception by the senses is assigned to the region supplied by an anastomosing nerve trunk or to the distribution of an irritated nerve.

Renal and Ureteric Regions.

Affections of the kidney are comparatively painless if the ureters remain patent. *Renal calculi* may give rise to three varieties of pain: (1) site pain, (2) referred pain, (3) renal colic. The site pain, which is more prominent during the diurnal hours of activity, is a dull ache, and is felt in the front of the loin, in the posterior renal angle behind, or in both places. The referred pain may be assigned to the healthy kidney (reno-renal reflex), testicle or labium, bladder, urethra, thigh, knee, calf, inside of foot, sole or heel, and may be of a burning nature. In renal colic the pain, which may be described as "tearing or griping," is characterized by agonizing paroxysms radiating down the line of the ureter and along the urethra, or referred to the external abdominal ring and into the testicle, causing contraction of the cremaster muscle.

Oxaluria may cause unilateral pain similar to that of renal calculus. Such pain as there may be in *tuberculous kidney* is a dull lumbar ache described as toothache-like, though tuberculous débris in a ureter may cause ureteric colic. *Movable kidney* is characterized by a dragging ache, aggravated by movement, but the kinking of a ureter in a Dietl's crisis may produce pain resembling the colic caused by a calculus. In *kidney tumour* pain, which is not increased by movement, may result from increased intrarenal tension, from ureteral obstruction by blood clot, or from pressure on surrounding structures. *Ureteral calculi* usually give rise to symptoms akin to those of renal calculi, the pain being due to the distension and spasmodic contraction of the kidney pelvis and of the ureter above the stone rather than to the irritation produced by the stone itself. Pain of a similar character may be caused by an aberrant blood vessel, by stricture or kinking of the ureter, or by its becoming blocked by tuberculous débris, blood clot, or a villous growth of the kidney pelvis.

Vesical and Urethral Regions.

Apart from acute blocking of the ureter genito-urinary pain as a rule has its source in the bladder, prostate, or prostatic urethra. Pain originating from the upper half or more of the bladder is usually felt above the pubis, but pain from the ureteric orifices and adjacent part of the bladder wall is sometimes referred to the corresponding inguinal ring or along the corresponding side of the penis. Perineal pain suggests disease of the vesical base or neck, of the prostate, prostatic or membranous urethra, or of some structure intimately associated with one of them, constant chronic pain being in most cases due to prostatitis, or to carcinoma or calculus of the prostate, and pain increased at the end of micturition to calculus, inflammation or ulceration of the bladder; but in any of these conditions the pain may be referred to the end of the penis. Urethral pain if before micturition is usually caused by obstruction from impacted calculi, etc.; if only during micturition, by inflammation or ulceration of the urethra.

Pain due to *vesical calculus* occurs principally at the end of micturition, and may be described as burning and stinging or sharp and cutting. It is usually felt at the neck of the bladder and in the urethra slightly behind the external meatus, but may be felt in the perineum and at the root of the penis. In children it is often very severe, the patient screaming and pulling at his foreskin, especially at the end of micturition; but in old patients if the stone lies in a post-prostatic pouch, so as not to come in contact with the vesical neck, little if any pain may be felt. The pain may gradually decrease owing to the calculus becoming larger and smoother by the deposit of phosphates around it. The effect of rest upon pain due to vesical calculus is so great as to be an important diagnostic sign.

Such pain as is caused by *calculi of the prostate* is usually felt only during and after micturition, but there may be a constant ache increased by defaecation and unconnected with micturition, while in *calculi of a seminal vesicle* painful defaecation and seminal ejaculation may occur. *Acute cystitis* produces scalding pain along the urethra during micturition, while at the end of the act, or if the patient tries to hold his water, there may be pain in the region of the vesical neck. In tuberculous cases severe pain as a rule indicates ulceration of the trigone or the onset of mixed infection. The features of pain in *acute urethritis and prostatitis* are too familiar to need any description. *Acute spermatocystitis* is associated

with deep pain in the perineum, pain on defaecation, and perhaps pain in the sacrum, testicle, or hip-joint. In *vesical tumour* there may be pain due to cystitis, blood clot blocking the urethra, ureteric obstruction, or pressure upon nerves. The pain may at first be unilateral, pointing to the growth being on the corresponding side of the bladder. In *carcinoma of the prostate* the pain, which is unconnected with micturition or movement, is usually a constant dull ache, but is sometimes severe and lancinating. It may be referred to the suprapubic region, urethra, perineum, hip-joints, thighs, testicles, etc., and is liable to be mistaken for sciatica.

Patients may complain of agonizing pain in the bladder, perineum, etc., and of other symptoms for which no adequate explanation can be found; but before diagnosing the condition as neurotic careful search must be made for an organic cause, and commencing spinal disease must not be forgotten.

TWO CASES OF INTRACRANIAL COMPLICATION OF ACUTE EAR DISEASE.

BY

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THE two cases described below of intracranial complication of acute otitis media were in-patients at the York County Hospital, one under the nominal care of one of us, the other of the other. The treatment, however, operative and other, as well as the process of diagnosis, was the joint work of both of us, so that they may be regarded as patients common to us jointly. They both present unusual features which seem to us to make them worth recording.

E. L., a man aged 36, was admitted on January 19th, 1922. Ten days previously he had had "influenza," and about a week previously, about January 12th, he became deaf in the right ear, and this ear began to discharge. A day or two later he became deaf in the left ear; but this ear did not discharge. There was a doubtful history of a rigor on January 18th, the day before admission.

On admission, both mastoid processes were somewhat tender; the patient was very deaf in both ears. The right drum membrane was acutely inflamed, and there was discharge from the tympanum. The left meatus was full of wax, and on removal the membrane was found somewhat inflamed, but not apparently bulging. The temperature was about 100°. There was some very slight swelling and redness of the right optic disc, and a doubtful swelling of the left disc. The patient was somewhat dull and lethargic, but did not appear very ill.

The right mastoid process was operated on the same evening. The mastoid cells were inflamed, and many of them contained granulations; but there was very little, if any, free pus. The lateral sinus was laid bare, but appeared to be healthy. The left drum membrane was freely incised.

Next day the conditions seemed to have improved, and there was but little change for a week, the temperature fluctuating between 98.4° and 100°. There was little, if any, discharge from the left ear. The general condition improved; there was less drowsiness and lethargy. The swelling of the optic discs, however, increased, and on January 23rd a haemorrhage was noticed in the neighbourhood of the left disc.

On the evening of January 26th he had a rigor, and the temperature rose to 105.8°. A diagnosis of thrombosis of the lateral sinus, which had formerly been suspected, was now definitely made, and it was decided to explore the sinus. The right sinus was suspected, there being but small evidence of any serious trouble on the left side. There was, in fact, little evidence, except deafness, of any trouble on the left side. The right sinus was accordingly laid bare at greater length. It looked healthy, but a needle was inserted into the sinus and blood aspirated from it. Blood came away freely, and it was evident that the sinus was not thrombosed, at least above the level of the jugular bulb. It was thought that the vein might be thrombosed at the bulb, and so the internal jugular was exposed in the neck, but it was quite evident that there was no thrombosis.

In view of the presence of the optic neuritis we decided, although there was no other evidence of brain abscess, to explore the temporo-sphenoidal lobe. The tegmen antri was removed, and an area of dura exposed. There was no extradural abscess. The dura appeared to be bulging. We opened it and passed a sinus forceps in several directions into the temporo-sphenoidal lobe, but no pus was found.

We were nonplussed. We had found nothing to account for the condition, and after a hurried consultation we decided to explore the left mastoid and left lateral sinus. The mastoid process was accordingly rapidly opened. The mastoid cells were inflamed and many of them filled with granulations, and on laying the sinus bare it did not look healthy. A syringe needle was inserted into the sinus, and no blood could be aspirated from it. The jugular vein was rapidly exposed in the neck and tied above the common facial, and the clot curetted out of the sinus until blood flowed freely from its upper end. The petrosals were evidently not thrombosed, so that the upper portion of the jugular vein had to be kept tied, and we were unable to wash through from the sinus. The temperature next day was normal. It rose on January 28th, and remained between 99° and 100.5° until February 9th. It is probable that this was due to pus in the upper portion of the jugular vein and bulb into which the septic thrombus broke down.

The pathologist's report showed that the blood aspirated from the right sinus was sterile, and a culture from the thrombus on the left side contained streptococci.

The condition of the patient continued to improve, except that the optic neuritis persisted, until February 20th, when he became drowsy and lethargic, and further operation was arranged for on February 21st. But on dressing the right ear on the morning of that day a copious discharge of pus was found in the right mastoid wound, apparently from the region of the exposed dura of the temporo-sphenoidal lobe, although the wound had so closed up that the source could not be precisely determined. From this time the patient made an uninterrupted recovery, and the optic neuritis rapidly disappeared. He was discharged on April 22nd, with both wounds healed, and hearing in both ears was good. He has been seen recently, and is in good health.

The course of events can now, in retrospect, be fairly well established. An infection of both middle ears was contracted, and while there was no violent inflammation of either mastoid process, there was an extension of the inflammatory process on the right side into the temporo-sphenoidal lobe, setting up a slow abscess there, and on the left side to the lateral sinus, setting up a septic thrombosis. By opening up the right temporo-sphenoidal lobe we allowed of an ultimate escape for the pus there, although we did not actually strike the abscess, which was undoubtedly present. On the other hand, had we struck the abscess at the time of the operation on January 26th it is quite likely that we might have been satisfied that we had found enough to account for the symptoms, and might not have attacked the thrombosis of the left sinus until too late. Had the abscess not evacuated itself spontaneously on February 21st we should most likely have attacked the left temporo-sphenoidal lobe before going back again to the right in view of the presence of the neighbouring septic condition in the right sinus. As it was, we did just enough to allow of recovery, and freely admit that this was largely a matter of good fortune in what was a puzzling case.

The second was a case of middle-ear disease, complicated by infection of the mastoid antrum and cells, and sinus thrombosis. The special feature was the extent of the thrombosis and the comparative mildness of the symptoms.

H. H., male aged 19, had a history of earache from the age of 6 years with intermittent discharge from the right ear, especially after he had "contracted a cold."

He was admitted to the hospital on November 19th, 1921, suffering from a scanty discharge from the right ear, and was feeling ill and shivery. The temperature was 102°, pulse rate 84, respiration rate 20. The right tympanic membrane was incised and a discharge of serum and blood came away. The following day he felt better, but later he had a rigor, with a temperature of 105° falling, with profuse perspiration, to 99.5°. We decided to open up the mastoid and explore the sinus. The mastoid cells and antrum were found to contain pus and granulations. The sinus was pulsating freely and appeared normal. It was explored and found to contain thin pus. The internal jugular was exposed in the anterior triangle; it had become practically converted into a bag containing fluid pus. The vein was divided, but it was found impossible to reach the lower limit of the clot although the vein was followed down to the level of the sterno-clavicular articulation. The sinus was followed backwards and to the bulb; it was opened and as much of the clot and thin pus removed as possible. Neither end of the vein was tied.

Bacteriological examination of a specimen taken at the time of operation was reported as a pure culture of streptococci. Intravenous injections of polyvalent antistreptococcic serum were given. Three days after operation streptococci were reported as being present in a blood specimen taken. An autogenous vaccine was prepared and given.

The progress of the case was uneventful, and on February 1st, 1922, the patient was discharged, his condition, according to our notes, being as follows: "Looking very fit. No dressing needed for mastoid or scar in the neck."

The remarkable features appeared to us to be the mildness of the symptoms considering the extent of the disease, the absence of pain over the classical sites, the extent of the thrombosis, the absence of pyaemic complications despite the presence of fluid pus in the jugular vein and of streptococci in the general blood system, and the impossibility of removing the whole of the infected material.

Our thanks are due to our house-surgeon, Dr. Janet Nicol, for her supervision and notes of these cases.

NINETIETH ANNUAL MEETING
OF THE
British Medical Association.
Held at Glasgow, July, 1922.

PROCEEDINGS OF SECTIONS.

SECTION OF OTOLOGY.
ALBERT A. GRAY, M.D., F.R.F.P.S., President.

DISCUSSION ON SEPTIC SINUS THROMBOSIS: ITS DIAGNOSIS AND TREATMENT.

OPENING PAPERS.

I.—DIAGNOSIS OF SEPTIC SINUS THROMBOSIS.

BY
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MR. PRESIDENT AND GENTLEMEN,—The presence of a thrombus in the lateral sinus is in effect an effort on the part of Nature to protect deeper-seated and more vulnerable structures. The most usual site of its location is in its sigmoid section, the next most frequent in its bulbar portion. So long as the thrombus remains sterile no particular harm results; but when infected, as practically invariably happens within a few days of its formation, a state of affairs detrimental to the health and inimical to the life of the individual is at once established. That its presence is at times overlooked, and a diagnosis of typhoid fever, bronchopneumonia, or malaria made, is unfortunately still too true.

The causative organism is, in my experience, invariably the streptococcus, and frequently the *Streptococcus haemolyticus*, but that its virulence and its toxicity vary in different stages in the progress of the disease is, I think, undoubted. I am disposed to think, however, that the ever-varying anatomical structure of the temporal bone and the relative position of the sinus to adjacent mastoid cells is of even more importance in the incidence of the disease than the virulence of the causal organism. A preliminary *x*-ray examination gives in certain cases a general idea of the geography of the petro-mastoid region and sinus groove, but, generally speaking, owing to the more or less acute illness of the patient it is seldom applicable as a diagnostic aid.

Thrombosis of the sinus is more likely to occur in the pneumatic than in the diploëtic variety of mastoid. In typical and in advanced cases diagnosis is as a rule not difficult, the remittent type of temperature, the rigors, the profound asthenia, the localized pain over the sinus and along the course of the jugular vein, at times accompanied by torticollis, presenting an almost unmistakable clinical picture. The right sinus is more frequently involved than the left, and sinus infection is more common in males than in females. It is the atypical case and the latent case, both by no means uncommon, which present diagnostic difficulties to even the most experienced, and yet it is an early and accurate diagnosis which tells almost more than anything else in the successful treatment of this particular affection.

Atypical cases, which, in my experience, are more frequently met with in children than in adults, are due at times either to dehiscences in the tympanic floor or to its extreme thinness with consequent infection of the bulb. In such cases no demonstrable symptoms of mastoid infection may be present. At other times the presence of a very forward sinus and an almost complete absence of mastoid cells is the responsible factor. To await the development of the full array of classical signs and symptoms is merely to court disaster. An intelligent appreciation and anticipation of the course of pathological events will materially assist in helping to make an early diagnosis, and an early diagnosis should spell early operative interference in order to prevent the advent of general septic poisoning.

The stage at which sterility of the existing thrombus gives place to infectivity is the all-important phase of the disease, and the one to which our thoughts should be mainly directed, for if only we could assure ourselves from clinical data of the precise moment at which this change takes place the chances of saving the patient's life would be materially increased. It is to this problem that I desire more especially to direct your attention.

On examining my records of intracranial complications secondary to purulent otitis media I find that thrombosis of the lateral sinus occurs in, roughly speaking, 50 per cent. of these cases, while septic meningitis occurs in nearly 60 per cent. Both complications tend to be solitary complications, but whereas meningitis is almost invariably fatal, sinus thrombosis has, if operated upon at a sufficiently early stage, the merit of being more amenable to surgical interference than any of the other intracranial complications usually met with.

The special proclivity to sinus infection as a complication of purulent otitis media is, I hold, to be explained mainly on anatomical grounds, the actual position of the sinus being very inconstant—at times situated quite superficially and approaching close to the posterior meatal wall, at other times lying deeply and separated from it by a considerable thickness of cellular bone. In brachycephalics it is said to be situated farther forwards and outwards than in dolichocephalics.

In the first place, the peculiar and intricate structure of the middle ear tends to prevent free drainage of tympano-antral suppuration; in the second place, and as a direct consequence of the frequent absence of free drainage, the temporal bone is peculiarly prone to septic infection; while in the third place, the relation of the lateral sinus to the mastoid antrum and to the numerous venous radicles which, running through the temporal bone, ultimately enter it, renders it specially liable to organismal attacks. Moreover, as the sinus is an interdural structure it is consequently more vulnerable than a structure separated from an existing septic focus by the full thickness of a normal dura mater.

While thrombosis of the sinus almost invariably occurs as the result of a chronic infective process, it must be borne in mind that it is by no means infrequently encountered during the acute stage of an otitis media, when its presence is prone to be overlooked, the infective path being either directly along venous radicles between the middle ear and the sinus, or by way of small venous tributaries connecting the tympanic mucosa with the petrosal sinuses.

Thrombosis secondary to acute septic otitis media is, in my experience, however, less dangerous than when secondary to chronic otitis media. It also occurs in cases where there has been merely a fleeting tympanic suppuration, or where it has entirely ceased, and the previously ruptured membrane healed. This is due to the fact that in the course of the tympano-antral suppuration the middle ear becomes occasionally entirely shut off from the antrum as the result of the fusion of granulation tissue in the "iter." I have seen several such anomalous cases myself, and others have been recorded by Mollison, Piolti, Friedmann, Greenfield, and others.

While sinus infection is usually due to extension of an existing bone lesion, it may also result from direct venous infection—for example, by way of an unobliterated petro-squamosal sinus, by way of the petrosal sinuses, or as the result of pus spreading between the dura and the petrous pyramid upon either its anterior or posterior surface. The resulting phlebitis may end in the formation of mural thrombosis or in complete obliteration of the sinus.

Thrombosis of periphlebitic origin is not only more gradual in its onset on account of the frequent presence of a barrier of protective granulation tissue, but is also more likely to end in perforation of the coats of the sinus wall, with the ultimate formation of an abscess in continuity with the area of suppuration within the mastoid cells.

Thrombosis of endophlebitic origin, where the infection is conveyed directly by the blood stream, is unattended for a considerable time by visible changes in the superimposed tissues or in the vessel wall, produces general infective symptoms more rapidly, and is thus the more dangerous type of infection. It is of the utmost importance that we should endeavour to discover from clinical signs and symptoms that phase of the disease where we have to deal with a non-infected clot and that phase when the clot has become infected. The presence of a non-infected clot is an actual safeguard, and if only the local disease be removed at the psychological moment its presence need not give rise to anxiety. If, however, the focal disease be not removed at once secondary infection of the clot is only a matter of a few days.

In any case of middle-ear suppuration, acute or chronic, where reasonable drainage exists, the occurrence of a rigor should always excite suspicion: it is a danger signal of the first importance. Moreover, the continuance of a high temperature for several days after a mastoid operation, especially if the patient be a child, should be regarded with equal suspicion.

The temperature record is, to my mind, one of the most important and reliable of diagnostic signs. To get real assistance from it an almost continuous record should be kept, but failing this at least a two-hourly record. The swinging morning and evening temperature with which we are all so familiar certainly indicates that thrombosis is in full bloom; but what the chart ought to show, and does show if records are made frequently enough, is the time at which disintegration is taking place. Sudden oscillations of more than one to one and a half degrees are unusual in uncomplicated suppurative mastoiditis, but frequent oscillations of from one to three degrees are quite common in commencing peri- or endo-phlebitic thrombosis, and their presence should at once put the clinician on his guard. In young people, among whom, as I have already stated, atypical cases are most frequently met with, temperature is a less exact guide than in adults, the tendency being for it to be continuously high rather than remittent. The pulse rate varies more or less regularly with the temperature, except in cases where an intracranial abscess is also present, when it may become almost unduly slow.

Too much stress is frequently laid upon the absence of rigors. Their presence, more especially if they recur frequently, is practically diagnostic; but their absence, providing certain other leading indications are present, should certainly not negative exploration. They occur only in about one-half of the cases. So long as the system is capable of throwing off the accumulating toxins there is no special reason why there should be any rigors; when overcharged, however, rigors are frequent. In children they are frequently absent throughout the whole course of the disease.

Chills and a feeling of chilliness are very important symptoms too often overlooked, although they are present in nearly 80 per cent. of cases. Frequent inspection of the hands, feet, and knee-caps should be made, as they are often found cold when the temperature is quite high.

Profuse sweating is by no means always present. At first it occurs as the temperature is subsiding, but in very severe cases may be almost continuous.

Important information, too often ignored, is to be obtained from a daily examination of the retinal veins. Ocular changes occur in some 75 per cent. of sinus cases, but are frequently so slight—although so important—that they may not be appreciated unless frequent examinations are made. An actual optic neuritis, however, occurs in only about 30 per cent. of the cases. As the sinus becomes gradually occluded the ipsolateral veins become slightly engorged owing to the venous "backwash," the contralateral veins remaining normal. A sudden diminution of engorgement indicates either that the thrombus has contracted or that it is breaking down, with the result that infective particles are being floated away in the blood stream. In the former event no rise of temperature takes place, in the latter it suddenly shoots up, and may or may not be accompanied by a rigor. For similar reasons the temporal, occipital, and facial veins, and at times the emissary mastoid vein, may get blocked, with a resulting slight oedema or puffiness of the adjacent subcutaneous connective tissue. When the sinus is occluded the normal venous hum over the internal jugular disappears, but is audible upon the opposite side.

The sign described by Crowe is also at times of value. Pressure upon a normal internal jugular vein produces demonstrable dilatation of the superficial veins of the forehead, eyelids, and temples, and to some slight degree of the retinal vessels, whereas pressure upon an already obstructed jugular vein has no such effect.

If on exposure of the sinus it be found to have a dark bluish colour it must not be taken for granted that no thrombus is present. In thrombosis of endophlebitic origin the walls retain for a considerable time their normal appearance; when of periphlebitic origin, however, their colour is usually grey or a yellowish-grey, protective granulation tissue being also frequently present.

Pulsation of the sinus synchronous with the respiratory movements may or may not be present. Whether present or absent, I have found the sign to be of little value. Diagnostic information of value is, in my experience, very rarely obtained from a blood count. The presence of a high degree of leucocytosis, or of large numbers of mononuclear leucocytes, is suggestive of pus, but by no means necessarily of pus in the sinus, or even around it. When, however, associated with other suspicious symptoms, it may be looked upon as a helpful aid.

Certain paralytic phenomena are also at times present, as, for example, paralysis of the hypoglossal nerve from the pressure of a thrombosed condyloid vein as it emerges from the anterior condyloid foramen.

When thrombosis of the jugular bulb is present the existing pressure may cause paralysis of the vagus, spinal accessory, or glosso-pharyngeal nerve. Should extension to the cavernous sinus take place paralysis of the abducens, the oculo-motorius, or the trigeminus may result.

Differential Diagnosis.

The disease with which sinus thrombosis is most likely to be mistaken is, in my experience, typhoid fever. During the first week of an attack of typhoid many of the symptoms are almost identical with those of sinus thrombosis, and if by chance the patient happens at the same time to have a suppurating ear confusion becomes confounded. The presence, however, of a Widal reaction and petechiae and the absence of very marked variations of temperature with rigors or chills are as a rule sufficiently distinctive.

At times it is difficult to distinguish thrombosis from a central bronchopneumonia. The persistent cough, the rusty sputum, and the more even temperature serve, however, as useful differential diagnostic aids. From malaria it is to be distinguished by means of a blood examination and the discovery of the *Plasmodium malariae*.

In rare cases in infants and young children severe gastric attacks, especially if at the same time the patient has running ears, are liable to mask an existing thrombosis and to confuse diagnosis.

While, Mr. President, all present will probably agree that typical cases present no great difficulty in diagnosis, all will, I think, equally agree that atypical and latent cases present extremely complex problems to the clinician. The value of an early and accurate diagnosis cannot be overestimated. My own practice is to attempt to unravel the complexities of the case as far as possible from clinical signs and symptoms, but when reasonable doubt exists I have no hesitation in performing an exploratory operation, in exposing or actually slitting up the sinus, purely and solely for diagnostic purposes. I have never had any reason to regret adopting this course of action, and have on quite a number of occasions had every reason to be thankful for having adopted it. Surgical surprises are still not uncommon in even the best regulated clinics, and the old adage *humanum est errare* is quite as true to-day as it was in days gone by.

II.—SOME DIFFICULTIES PRESENTED BY CASES OF SEPTIC SINUS THROMBOSIS.

BY

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MR. PRESIDENT,—It was at your request that I wrote for this meeting a short paper on some difficulties in dealing with cases of sinus thrombosis. Unfortunately, since then Mr. Hunter Tod, who was to have seconded Sir William Milligan in opening the discussion, has found himself unable to fulfil this engagement. Your loss is a severe one, since he has a large experience of this complication of aural disease and the power of clear exposition, so that you would have received from him something far more illuminating and worthy of discussion than I can give you. I have, however, endeavoured to supplement the paper by reference to some of the literature of recent years, so that if it now smells somewhat of the lamp the blame is partly yours, but I hope to present to you some points which will arouse discussion.

Difficulties in Diagnosis.

(*a*) The condition may be confused with malaria, especially if rigors occur.

A soldier was invalided home from Salonica in order that a mastoid operation might be performed for the cure of chronic otorrhoea accompanied by persistent pain. After three days in England he passed a medical board and was dispatched to the western front, where he served in the trenches for a short time before being once more evacuated. On admission to a clearing

station he was suffering from slight diarrhoea, pyrexia, and severe pain in the left ear, from which there was a foul discharge; his pulse was 120. He stated that he had had malaria in Salonica. Soon after admission the temperature rose still higher, and the patient had a rigor. A radical mastoid operation revealed the ordinary type of caries of the middle ear and antrum; the lateral sinus appeared healthy. This operation caused no alteration in the general condition, and a microscopic examination of the blood, obtained on the following day, revealed numerous malaria parasites. The patient rapidly recovered after the administration of quinine. In this case no harm was done, as the operation was needed in any case, though not perhaps at that moment; but it was felt after consultation with a physician that a mistake in the contrary direction might cost the patient his life.

This difficulty in diagnosis seems to be quite common in America, and perhaps since the war it may have become commoner in this country. Quite recently a young lady developed a temperature of 105° after a mastoid operation, and it was only then learnt that she had been in a tropical country and had had malaria.

(*b*) It may be mistaken for typhoid fever. My friend Mr. Jasper Blaxland of Norwich has given me the following record:

A woman, aged 32, had been ill for ten days, complaining especially of headache, but had no pain. Her doctor thought her illness might be typhoid fever, but the Widal reaction was negative. She had had bilateral otorrhoea for twenty years following scarlet fever and was very deaf. It was not until the tenth day of the illness that tenderness was noticed over the left mastoid. At the operation performed the same day the antrum and cells were found to contain pus and cholesteatoma. The lateral sinus was covered with granulations. There was at first some apparent improvement, but subsequently the patient had a rigor, and six days after the first operation the jugular vein was ligatured and divided. The lateral sinus, which contained pus, was followed back almost to the torcula. The inner wall of the sinus eventually sloughed, leaving the cerebellum exposed, covered with granulations. A few days later oedema of the eyelids, cheeks, and upper lip seemed to indicate spread of the thrombosis to the cavernous sinus, but these symptoms gradually disappeared. This patient remains well up to the present time, nine years later.

The following case presented great difficulties in diagnosis. Fortunately no mistake was made or the patient's life would have been lost.

A girl, aged 13, had measles. On the ninth day she had a rigor with a temperature of 105° and signs of pus in the right antrum of Highmore. The following day the maxillary antrum was punctured and thick pus washed out. Two days later signs of suppuration in the right mastoid appeared and Schwartze's operation was performed, the mastoid cells and antrum being found full of pus. An opening was also made through the nose into the maxillary antrum with a burr. The antrum was afterwards washed out a few times and gave no further trouble. The patient remained very ill with a high temperature and pulse rate, and there appeared signs of suppuration in the left mastoid four days later. The Schwartze operation was therefore performed on this side also. After this the condition of the patient showed no improvement, the temperature rising to 104° at night from normal in the morning, whilst the pulse rate varied from 120 to 140. The lateral sinuses, which had been exposed on either side, appeared healthy, but the wounds remained absolutely inactive with no sign of healing nor the formation of granulations. Applications of hypertonic saline with the object of stimulating the wounds had no effect. The condition of the patient became desperate and a rapidly fatal result seemed almost inevitable, but she improved slightly and a blood culture was taken. The culture showed next day a pure growth of *B. typhosus*. The patient was seen by a physician, who refused at first to entertain the diagnosis of typhoid since the swinging character of the temperature, the extreme rapidity of the pulse, the condition of the abdomen, the nature of the stools, and the absence of rose spots and enlargement of the spleen were all against it. He was, however, unable to dispute the evidence of the blood culture. The patient eventually recovered after a somewhat stormy convalescence, and she remains well with perfect hearing.

Mason[1] has reported a case of thrombosis of the jugular bulb caused by the *B. typhosus*, probably starting in the third week of typhoid fever. The *B. typhosus* was grown in pure culture. This patient recovered after operation.

Although in the exceptional case just mentioned the blood culture proved of great value it is not as a rule of much assistance in the diagnosis of sinus infection. Kopetzky[2] has well defined its limitations as follows;

"In the finding of streptococci in the blood stream there is substantiation of a diagnosis of sinus thrombosis, all other sources of infection being eliminated; but in the event of negative findings then it is better to operate on the clinical findings than to let pass the time when surgical intervention will result in a successful issue."

(*c*) Sinus thrombosis most commonly occurs as a complication of chronic otorrhoea, in which case the onset and symptoms are more likely to indicate the diagnosis than if it follows acute middle-ear suppuration, which may mask the presence of the complication. A remarkable case has been recorded by Dunbar Roy[3] in which bilateral inflammation of the external auditory canal was followed by bilateral sinus thrombosis from direct extension to the mastoid emissary veins. There were no inflammatory changes whatever either in the middle ears or in the mastoid cells.

Perhaps insufficient importance has been attached to the mastoid emissary veins. Kieler[4] has recorded a case of septic thrombosis of an exposed mastoid emissary vein secondary to a simple mastoid operation. Ligature and resection of the emissary vein cured this patient, and he regards this as a more common focus of infection than is generally supposed.

(*d*) Sinus thrombosis may be difficult to distinguish from or it may be accompanied by other intracranial complications. Numerous cases have been reported in which meningitis and especially cerebellar abscess have been associated with this condition, and I wish to refer here to the occurrence and significance of optic neuritis. Usually the fundus oculi is normal or shows merely some congestion of the retinal veins. Crockett, quoted by Kerrison,[5] found optic neuritis in 25 per cent. of cases (in 16 out of 60). Kerrison states that this is a larger percentage than has been recorded by other observers. Milligan[6] states that optic neuritis is present in nearly 40 per cent. of the cases. My own experience has been that it is at least as frequent as Crockett states and that it is not necessarily a sign of ill omen. The important point is that optic neuritis may occur without the presence of any other intracranial complication but septic thrombosis. It might be thought unnecessary to draw attention to this, but I have been present at a discussion by the bedside on this point by those who might have been expected to be better informed. The patient in this instance recovered after the sinus had been opened and the jugular ligatured.

The swelling of the optic disc almost always subsides, but Friedenwald and Downey[7] have reported a case in which a subtemporal decompression became necessary on account of persistent choked disc following lateral sinus thrombosis with progressive failure of vision. They refer also to another case from a German source. The necessity for this must be very uncommon, because lumbar puncture would usually give relief to a coexistent serous meningitis.

Difficulties in Determining the Condition of the Exposed Sinus.

If the wall of the lateral sinus is found to be sloughing there can be no doubt regarding the nature of the disease and the treatment required. The wall of the sinus may, however, be found covered with granulations forming the boundary of a perisinous abscess, or it may be apparently normal. In these circumstances Professor Moure[8] attaches great importance to pulsation in the sinus as an indication of the presence of a thrombus within. Granulations on the wall should be carefully searched for any tiny visible spot through which the infection may have reached the interior. If rigors have begun it is better to assume that an intravenous infection has commenced and act accordingly. If the symptoms are equivocal it is justifiable to wait. The following case illustrates this:

A boy, aged 7, had suffered from acute otitis media for a week. He was seen about 10.30 on a Thursday evening. The Schwartze operation was performed and revealed a perisinous abscess, the sinus wall being covered with granulations. As the pyrexia continued for thirty-six hours, although there was no rigor, on the following Saturday morning the sinus was opened and found full of septic clot. After this recovery was uninterrupted.

It is futile and dangerous to aspirate the sinus or puncture it with a hollow needle, since this proceeding cannot be relied upon to give any definite information, and it may well of itself induce a septic thrombosis by injuring the intima of a previously healthy sinus. Therefore it is better to do nothing or else deliberately incise the sinus. Aspiration of the sinus seems especially dangerous, since accidental injuries, though usually innocuous when properly dealt with, may lead to septic thrombosis. The following is an example:

A soldier, who was a driver in the Tank Corps, suffered from chronic otorrhoea on the right side. This caused him pain and headache, and he was unable to bear the noise and vibration of the machinery inside the tank. He agreed therefore to have a radical operation. It was found that the knee of the sinus lay so far forward that the posterior wall of the bony meatus was only one-sixteenth of an inch in thickness. I was at first inclined to abandon the operation; it was completed, however, by employing the method of Stacke, but the sinus was wounded before the end of the operation. The thrombus in the sinus afterwards became

septic, and it was necessary to tie the jugular. The patient recovered, but the ligature of the jugular was followed by perichondritis of the auricle, which caused some trouble.

Too much care cannot be taken to avoid manipulating an exposed but healthy sinus, since a very slight injury, not sufficient to open the lumen, may occasionally cause a septic thrombosis. Hunter Tod[9] has drawn attention to such cases, in which the symptoms begin to appear about ten days after the mastoid operation. The following is an example:

A woman, aged 36, had a discharge from the right ear for many years. She had periodical attacks of pain and headache and the meatus was filled with polypi and granulations. At first she refused operation and attended the out-patient department for six months, but finally changed her mind. At the operation the sinus was exposed but was not known to be injured. On the tenth day an unexplained pyrexia commenced and its significance was not realized until the patient had a rigor. Five minutes before the time fixed for reopening the wound and probably tying the jugular vein a pulmonary infarct occurred. The shock of this was so great that at first it appeared as though a fatal result would ensue immediately, but a little later it was possible to carry out the operation. The patient ultimately died from an empyema and lung abscess, no doubt caused by the septic embolus. It must be assumed that there was some slight injury to the lateral sinus at the first operation.

Difficulties Connected with Further Complications.

The ordinary pyaemic complications are familiar. These patients cannot be watched too carefully for metastatic abscesses and effusions into the serous cavities. One of my patients developed most insidiously a large pyaemic abscess in each buttock; an ankle and an elbow-joint were also infected, but he ultimately made a complete recovery.

A complication to which I understand you desire that some reference should be made is the spread of the thrombosis to the petrosal and cavernous sinuses. It seems that in these circumstances the chief difficulty is to determine whether the cavernous sinus is occupied by aseptic or infected clot. The first condition is undoubtedly not rare, and explains the cases of recovery. On the other hand, if the clot be infected the only possibility of saving the patient is by operation, and that with very little delay, since the infection will readily cross by the circular sinus to the opposite side, and once that has happened there can be no hope of success.

Ritchie Rodger[10] and F. G. Wrigley[11] have each reported a case in which the lateral sinus contained fluid blood, and the thrombosis was apparently primary in the superior petrosal sinus. The rush of blood from the lateral sinus in each instance carried the clot out of the petrosal sinus, and Wrigley's case recovered. They go so far as to suggest that this might be deliberately employed as a method of treatment, but I think that the amount of blood to be spared for this purpose should be very limited.

As soon as thrombosis has occurred in the cavernous sinus the corresponding side of the face and eye present a characteristic picture which Sir William Milligan has well described to you just now. The question immediately arises whether operation on the cavernous sinus is to be undertaken—this certainly should not be done without careful consideration. A number of cases of recovery have been reported, and when the direction of the blood stream is taken into consideration it must be the case that the head of the clot advancing against the stream is at first aseptic. It may so remain and recovery take place, the symptoms being due simply to blockage of the cavernous sinus and not to sepsis. In a case of my own the signs and symptoms were quite characteristic and I proposed to do the operation to which I shall refer shortly. I consulted a senior colleague who restrained me. This patient made a complete and unexpected recovery, no doubt because the clot was aseptic. If, however, it is reasonably certain that the cavernous sinus contains infected clot the only hope lies in early operation, and it should certainly be undertaken. Various routes have been proposed, but the most rational method is that recommended by Sir Charles Ballance.[12] It is the only one at present worth consideration in an otogenic case, since it is the posterior end of the cavernous sinus which must be attacked. The sinus is reached by the Hartley-Krause method of exposing the Gasserian ganglion. In Ballance's second case, although the patient died of septicaemia, the operation effectively dealt with the cavernous sinus. My colleague Mr. Frankau has attempted the same operation in two cases, of which he has kindly given me brief notes. In each case the condition followed a mastoid operation, one four days, the other five days previously. The cavernous sinus was reached in each case, the septic clot evacuated, and the cavity drained. Both cases succumbed. Meningitis was present in the first case, but in the second case, which occurred in private practice, a necropsy was not obtained.

The condition is a desperate one, and I do not think that the failure to save life by operation so far, except in Bircher's case, should deter from further efforts in this direction. It is not to be expected that any large proportion of attempts will ever be successful in face of the difficulty of dealing at the same time with the bulb, the inferior petrosal sinus, and possibly other complications, such as meningitis and septicaemia. (A full discussion of the subject may be found in the papers to which reference has been made.)

Difficulties in Determining the Necessity and Nature of the Operation on the Jugular Vein.

It is possible for spontaneous recovery from lateral sinus thrombosis to occur, though no surgeon having once recognized the condition would await such a result. Nevertheless, the number of recorded cases is surprising. Ewing Day,[13] for example, reported 6 cases of spontaneous healing out of 45 cases of sinus thrombosis; that is to say, the sinus was obliterated by a clot which had been completely transformed into aseptic fibrous tissue. Friedenwald[14] has collected a number of cases and reported one of his own, in which a septic thrombus formed, but was shut off from the circulation by healthy clots, and the pus escaped through the mastoid emissary vein, producing simply a localized abscess. This tendency to recovery indicates that the operation should not be more extensive than is necessary to assist the efforts of nature. At the other extreme are cases of pyaemia, and a case is mentioned by C. E. West[15] in which the septic thrombus was so extensive that ligature of both jugulars was necessary. Whitehead[16] has reported a case in which both lateral sinuses and the longitudinal sinus were blocked. This patient recovered.

Many cases recover without ligature of the vein, and personally I have not lost a case in which the vein was not ligatured. Professor Moure, reporting on fifteen cases of suppurative phlebitis to the Belgian Otological Society in 1906, stated that he never ligatured the jugular, and Pierre Pietri,[17] in a report from Professor Moure's clinic in 1918, writes as follows:

"Inutile contre l'entrée de l'air, les hémorragies et les embolies, inefficace contre la pyohémie et les metastases, la ligature de la jugulaire n'est pour le chirurgien qu'une complication opératoire et pour le malade qu'un traumatisme surajouté. Les résultats des statistiques sérieusement établies confirment pleinement cette manière de voir; la proportion de guérisons est la même avec ou sans ligature. Bien plus dans un certain nombre de cas, elle devient même dangereuse."

There is therefore an important school which considers ligature of the jugular a useless and dangerous proceeding, unless the clot has actually reached the neck, whilst a few surgeons tie the vein as a precaution in every case. The truth surely lies between these extremes. The gravity of this addition to the operation has been exaggerated, since in an ordinary case it adds but little to the severity, whilst, as Firth[18] has written, "Unfortunately it will always be in cases of sinus thrombosis of the severest type and the longest standing, those in which the patient is least able to bear a prolonged operation, that ligature of the vein will be most essential for successful treatment."

The vein may be ligatured in continuity, divided between two ligatures, resected, or after division the upper end may be brought out on to the surface. Much has been written on the indications and contraindications for these various methods, but the following considerations cover the field briefly.

It should be clearly understood that the operation on the vein has two distinct ends in view: first, to provide free drainage for any septic material in the sigmoid sinus, bulb, or jugular vein; and secondly, to cut off the escape of septic material into the general venous circulation. The most rational and efficient method of attaining these two objects is that recommended by Sir Charles Ballance. The vein is divided between two ligatures. The upper segment is dissected up, any tributaries, of which the common facial is the most important, being also tied and divided, and is fixed in the upper angle of the wound. The end is left hanging out of the wound and the ligature is taken off as soon as possible, so that free drainage is provided. I do not see any indication for the elaborate and severe operations which have been described and practised on the bulb. They do not appear to give any real assistance towards the object

in view which cannot be equally well attained by simply following the sigmoid sinus towards the bulb and dealing with the vein in the neck in this fashion. The indications for this operation have been so clearly stated by the same authority that I cannot do better than close these remarks with the following quotations from his writings:

"The view that operation on the vein is never required, and the view that operation on the vein is always required, are equally erroneous. It is as absurd to tie the vein for a local abscess, which should be dealt with in the sinus region as in other parts of the body by simple evacuation, as it is to decry all operations on the vein, when it may contain a spreading infective clot which has been known to reach the heart."[19]

"Operation on the vein should be undertaken (*a*) in acute pyaemia and septicaemia, whether the sinus is occupied by clot or by fluid blood; (*b*) if the sinus wall is gangrenous, or its contents are putrefying, unless it is perfectly clear that on both sides of the area of inflammation the sinus is completely blocked by non-infected thrombi (how seldom this qualification will be operative must be obvious to all who have had any considerable experience of these cases); (*c*) if it is proved or even suspected that the blood in the jugular bulb is in part or wholly clotted; and (*d*) if the jugular vein is thrombosed."[20]

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DISCUSSION.

Mr. T. RITCHIE RODGER (Hull) said: It is difficult to estimate from a survey of the literature of the subject what proportion of cases of cavernous sinus thrombosis are an extension from a thrombosis in the sigmoid sinus and jugular bulb by way of the superior and inferior petrosals. Dwight and Germain concluded that 43 of their 182 collected cases were so caused; but as their review included the earliest cases reported details are wanting in many. In January, 1921, I reported four cases of cavernous sinus thrombosis to the Otological Section of the Royal Society of Medicine, of which cases one was an illustration of such extension, while in one other we were able to demonstrate a direct infection of the superior petrosal sinus by way of the small tympanic veins which drain into it. In this case rigors and extreme variations of temperature indicated a sinus thrombosis, and I exposed the sigmoid sinus accordingly. It appeared quite healthy, however, and I aspirated liquid blood from it, contenting myself with ligature of the jugular vein till the blood removed should be examined. Pneumococci were reported to be present, and I presumed I was dealing with either a mural clot, not yet large enough to occlude the sinus, or a clot in the lateral sinus posterior to the point where the superior petrosal empties itself. Two days later I therefore opened the sigmoid sinus, which was now filled with clean red clot as a result of the ligation of the jugular, and when this had been scooped away, and the flow of blood from above established, two small worm-like pieces of grey-black clot were washed out, just of the calibre of the superior petrosal sinus. We presumed that the superior petrosal had been primarily infected, and that from that seat was being discharged into the blood stream the organisms which gave rise to the rigors and high temperature usually associated with sigmoid sinus thrombosis. The previous history of the case supported this, as the patient had giddiness and facial paralysis before admission, indicating infection of the petrous. The other two cases were infected from in front—one from a facial carbuncle, the other from a frontal sinusitis. Since then I have had under my care two more cases, both of them illustrating infection from below, from an acute suppuration of the sphenoidal cell. Thus only in one case of six has there been extension of sepsis from the sigmoid sinus to the cavernous. The two cases last seen were almost identical in course and symptomatology, although different in onset.

CASE I.

A male, aged 29, was referred to my out-patient clinic by one of the general surgeons, with very large glands in the neck and below the lower jaw on the right side, the question being whether the obviously diseased tonsils might be the cause of the glandular condition. He had also been referred to the dentist, who had earlier in the same day on which I saw him extracted twelve teeth. I advised removal of the tonsils, but recommended postponement till the mouth should have cleaned up somewhat. He was admitted under the surgeon's care, and I was again asked to see him three days later, as he had developed a purulent discharge from the right side of the nose and was running a high temperature. The right antrum was found to be full of pus, infection having occurred through a perforated tooth socket. Lavage by the nasal route having failed to produce any improvement, the intranasal antrum operation was performed. A week later severe frontal headache on the same side developed and a few days later the frontal sinus was quite dark on transillumination. The middle turbinal was amputated with the hope of establishing drainage, and the headache was at once improved and the temperature fell. He was discharged from the ward to come up as an out-patient, but failed to report for three weeks, when he came back looking very ill, with marked proptosis and oedema of the face. The radical frontal sinus operation was performed, no pus being present, but the mucous membrane was found to be gangrenous. The same condition obtained in the ethmoid cells, and from the antrum, which now communicated with the mouth by a large alveolar opening, the whole gangrenous mucosa was extracted in a mass by forceps. Death occurred after a few days. On *post-mortem* examination the antrum, ethmoid labyrinth, and frontal sinus were clean. The dura over the sella turcica was dark-coloured; the cavernous sinus on the left side was full of grey clot, that on the right was indistinguishable, the pituitary body and its surrounding structures forming a soft grey indefinable mass. The sphenoidal sinus was full of caseous material and its lining showed the same gangrenous condition as was found in the other sinuses operated upon. The extreme anterior tip of the temporo-sphenoidal lobe of the brain was discoloured greenish-grey and softened.

In this case, had we succeeded in clearing out the sphenoidal cell and its gangrenous lining with the same thoroughness as we finally attained in the case of the other sinuses involved, it is probable that the intracranial condition would not have ensued.

CASE II.

A female, aged 38. This case was very similar to Case I, except that the onset seemed to be due to an acute infective rhinitis. When first seen the patient had swelling of the right eyelids, with temperature 103° and tenderness over the right antral wall under the cheek. The right nasal fossa was completely blocked from general turgescence of the mucosa, and there was pus present. The left nasal fossa was normal. The left antrum and both frontals illuminated well, while the right antrum was completely dark. Several drachms of clear straw-coloured fluid were withdrawn from the latter on exploration. After a few days of unavailing conservative treatment the antrum was opened and the middle turbinal removed, the tissues being found necrotic. The general condition became gradually worse and frontal sinus symptoms developed. The radical frontal sinus operation revealed the same gangrenous condition as in the other case. The eyes became more and more proptosed and immobile, and death ensued four weeks after the patient was first seen. Necropsy was not allowed, but there seems little doubt that this case was almost an exact parallel of the other.

Sir StClair Thomson has pointed out the probable frequency of this mode of infection of the cavernous sinus. When one thinks of the thin plate of bone, sometimes even wanting in parts, which forms alike the roof of the sphenoidal cell and the floor of the cavernous sinus—a bony plate certainly no thicker than that which separates the sigmoid sinus from the posterior mastoid cells—the possibility of extension of infection by erosion or by lymphatic or venous spread is apparent. Of course, the sphenoidal cell has a more or less efficient natural opening, an advantage denied to the posterior mastoid cells; and, moreover, infection of the sphenoidal cell is probably much less common than mastoiditis, hence the infrequency of one condition as compared with the other. Probably extension to the cavernous sinus from the cell beneath is more likely to occur in cases such as these two, where, all through, the accessory sinus infection was characterized by an acute gangrenous condition of the mucosa with very little formation of pus. Pus can escape from the ostium sphenoidale, but this opening is a very poor safeguard where the lining of the cell is gangrenous. Moreover, in these gangrenous cases bone erosion doubtless takes place readily. The antrum and ethmoid operations in both these cases gave one the impression of tearing through wet brown paper rather than bone.

Dr. HOLGER MYGIND (Copenhagen) said: I agree entirely with Sir William Milligan that the sigmoid sinus ought to be exposed and the interior explored in all doubtful cases. I would even go farther and say that if there is only the slightest doubt this exploratory operation ought to be performed. As far as the surgical treatment is concerned, at the first period of my surgical experience I was not very inclined to tie the internal jugular vein; then I saw several

cases where the ligature seemed to have stopped the progress of the disease and I applied the ligature very frequently. For the last five years I have, however, gone back to my old view and only use ligatures in cases where there is pus in the bulb, so that the upper part of the internal jugular vein may serve as a drainage tube. I do not go so far as to say that ligation is an injurious procedure, but my experience now is that it is generally useless, as will be seen from the 144 cases I have operated upon. Of these, 54 were treated with ligature, and of those 51.6 per cent. recovered, while amongst 90 treated without ligature 48.8 per cent. recovered, which practically shows no difference. My statistics also show that metastatic diseases of the lungs—the most fatal complications of sinus-phlebitis—occur in 27.7 per cent. of the cases treated without ligature and in 28 per cent. of those where ligature was applied. A very important factor as far as the prognosis is concerned is the question of whether the sinus phlebitis is complicated or not with other intracranial diseases, as the following statistics show:

	Total.	Recovered.
Sinus thrombosis (uncomplicated) ...	69 ...	54=78.3%
Sinus thrombosis + meningitis	42 ...	16=38.1%
Sinus thrombosis + subdural abscess ...	3 ...	1=33.3%
Sinus thrombosis + brain abscess ...	2 ...	0
Sinus thrombosis + brain abscess + meningitis	15 ...	0
Sinus thrombosis + subdural abscess + meningitis	6 ...	0
Sinus thrombosis + subdural abscess + meningitis + brain abscess	7 ...	1=17.3%
Total	144 ...	72=50.0%

Age also is of very great importance as far as the prognosis is concerned, for in the period of from 20 to 29 years all cases of uncomplicated sinus thrombosis I have operated upon recovered, while from 30 to 39 years only 71 per cent. recovered, and the two patients over 50 years I have operated upon both died.

Dr. WM. HILL remarked on the want of uniformity in practice, not merely as regards tying the jugular vein, but also as to the extent of exposure and the exact clinical method of examining and exploring the sinus with a view to determining whether (1) the sinus wall was normal and its contents normal blood; or (2) there was clot, infected or otherwise; or (3) suppurating contents. It was desirable to remove enough bone to expose the sigmoid sinus for an inch. Pulsation, seen and felt, might appear to be absent in an exposure of the size of a threepenny bit when obviously seen and felt in a larger exposure; this pulsation rather pointed in favour of a normal condition of the wall and of contents. Where there was a doubt was it considered justifiable to insert a small hollow needle and aspirate and examine its contents? What precautions should be taken to prevent contaminating the sinus by the aspirating? Should not this preliminary aspiration precede slitting up the sinus, and should the exploratory incision in the first instance be a small one and then later enlarged if found diseased? The jugular vein was much less frequently dealt with in the neck than five-and-twenty years ago. If the thrombosis could be felt in the neck that was one indication for bringing the dissected upper portion of the vein out of the wound; also when it was certain that there was pus or a very septic clot in the jugular bulb.

Dr. DAN MCKENZIE said that the diagnosis, particularly in the early stages of lateral sinus thrombosis, was frequently difficult, but the problem might be avoided by operating on the sinus on suspicion. This might be the more readily done, as exploratory operation was remarkably free from danger. The sinus should be exposed, freely opened up by a long incision, and, after arrest of bleeding, the interior of the vein carefully inspected. As regards the resection of the jugular vein in the neck, he always employed it when exploration of the sinus had revealed a clot. This step did not seriously add to the risk of the operation, and, in spite of opinions to the contrary, jugular resection did close the direct route between the lateral sinus and the general circulation. To this practice he had come, having been taught by fatal cases, which he attributed to the omission of this simple step.

Mr. FRANCIS MUECKE said that sinus thrombosis almost entirely prevailed among the poorer classes; it was in fact a disease of neglect. Only about 2 per cent. of the cases occurred in the better classes, and then generally they were of the acute streptococcal type. Among the symptoms he pointed out the almost constant appearance of sordes about the gums and mouth, and herpes on the lips, and the false "general well-being" of the patient. He seldom saw the textbook symptoms of mastoid tenderness, swelling, and redness. The ordinary visible aural discharge frequently stopped some three or four months before the sinus symptoms appeared, but an aural examination would reveal a bead of pus sheltering small granulations. The mop on withdrawal would be found to have a peculiarly penetrating and disgusting odour; that part of the meatus close to the posterior edge of the drum would be red and granulating. Common mistakes in diagnosis were those of pneumonia, typhoid, or pyaemia of unknown origin, the absence of visible discharge having put the medical attendant off the scent. He was certain that a number of cases so called were not sinus thrombosis but rather meningo-phlebitis only, and would clear up entirely with the ordinary mastoid operation. He frequently found the sinus covered with profuse granulations and bathed in pus, and it was difficult to decide whether thrombosis was present. A simple method that he had found very efficacious was to push the sinus in with a blunt instrument, and if it sprang back quickly and evenly he left it alone, for even a thin parietal clot would prevent an even return. This method had seldom failed him. When clot was definitely present he plugged well above the clot and plugged the bulb if necessary. After eliminating the clot he freed the upper plug for a moment to give free flow. He always tied the jugular vein, for he knew of no way of being sure that some portion of clot would not escape. It seemed to him to be the only surgical procedure; it in no way added to the danger of the operation. There was no need to syringe through the vein or pull out the upper end. As a routine measure he gave four doses of 10 c.cm. of polyvalent antistreptococcal serum. Speed in operating he considered an essential feature of success owing to the toxic condition. As to the prognosis, 80 per cent. of cases uncomplicated by lung or cerebral conditions recovered. Pneumonia was a fatal complication—he only knew of one recovery. Joint complications were by no means unfavourable. Marked optic neuritis was seldom present—generally a slight dilatation of the vessels only. Blood tests were of little diagnostic value. Streptococci were more often found in the urine than in the blood. Following a mastoid operation sinus infection generally occurred about the tenth day. He believed dressing and antiseptics were more often the cause than operation injury. If he had cause to think sinus thrombosis present he operated as soon as he possibly could rather than wait for special tests to be done.

Sir JAMES DUNDAS-GRANT welcomed Professor Mygind's views in regard to ligature of the jugular vein, which agreed with his own expressed opinion. He would consider sordes (as pointed out by Mr. Muecke) of greater significance when associated with preservation of mental clearness. Sir William Milligan in his admirable exposition had referred to the rarity of sinus phlebitis in infants. This was explained by the great distance at which the sinus in infants was behind the mastoid. Macewen's line would in them lead to the cerebellum, as shown by some German investigations reproduced in Ballance's work on the temporal bone. The ligature of the vein was an important incident, but not the essential part of the operation, which was free exposure of the sinus, examination as to refilling after compression (refilling from below indicating absence of thrombotic obstruction of the bulb), and free incision. If (as often observed by Sir William Macewen) there was found a mass of broken-down purulent clot with healthy clot (or free normal haemorrhage) the broken-down portion might be cleared away without ligature of the jugular. If the jugular was ligatured it was imperative that the lower end of the upper part should be brought to the surface to permit of subsequent drainage. He had seen signs of danger persist until spontaneous extension of a ligature and escape of pus took place. He had opened the bulb (Grunert's operation) on two occasions and recovery followed each time, but it was very rarely necessary to do this. A catheter might be passed up the jugular vein to the dome of the bulb and suction exercised by means of a syringe. Koerner recommended, a number of years ago, for the treatment of cavernous sinus thrombosis the encouragement of free haemorrhage from the lateral sinus in hope of bringing away the clot.

Dr. ANDREW WYLIE remarked that there was very little to say after such excellent papers had been read on the subject, but he might mention that most of his cases had been

females. Hunter Tod in 1919 demonstrated that such complications developed on the tenth day, and therefore no mastoid case should be allowed out of bed until after that time. They were all agreed that no needles or syringes should be used; the sinus should be freely opened, and if the temperature did not drop and the case was one of pure septicaemia, then into one of the veins in the arm 20 c.cm. of 1 in 2,000 solution of corrosive sublimate should be injected. This would cure the case unless a septic bulbar clot was present. Mr. Colledge remarked that malaria and septic sinus conditions had been complicated, and he (Dr. Wylie) remembered once opening a sinus which was quite healthy, the rigor and fever having been caused by malaria. There was sometimes also a difficulty, in cases where a suppuration in both ears was present, to know which to open when symptoms of sinus infection appeared. The eye symptom must be relied upon in such cases. He did not ligature the jugular in the first place, merely opening the sinus freely, but if there was no improvement, then a more thorough operation should be performed and the vein ligatured.

Dr. W. S. SYME (Glasgow) said that spontaneous cures of lateral sinus thrombosis might result was exemplified by a case which came under his care. A woman, following the birth of a child, developed what was thought to be puerperal septicaemia, and she was treated accordingly, and after some time recovered. Several years later he performed a radical mastoid operation on her for otorrhoea of many years' duration. The sigmoid sinus was extensively exposed by the disease and was found to be completely converted into a firm fibrous band.

Dr. DOUGLAS GUTHRIE (Edinburgh) described a case in which removal of an aural polypus was followed by sigmoid sinus thrombosis. The earliest symptom was pain on swallowing in the region of the tonsil on the affected side. He was unaware of any mention of this symptom in cases recorded in literature. Another interesting phenomenon which was noted in the above case was that the profuse perspiration was unilateral. It was confined to the side of the lesion and affected the side of the head and neck and also the arm. This continued for several days after the temperature, as a result of operation, had subsided, and was unaccompanied by any other signs, such as dilatation of the pupil, suggesting a lesion of the sympathetic system.

The President, Dr. A. A. GRAY, drew attention to the importance of not injuring the sinus in ordinary mastoid operations. It was possible that highly penetrating antiseptics—for example, eusol—might cause thrombosis in an exposed sinus.

BENIGN FORMS OF OTOGENIC MENINGITIS.

BY

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[*Abstract.*]

THIS paper is based upon the observation of 210 cases of otogenic meningitis of all forms treated in the ear and throat department of the Copenhagen Commune Hospital during the last seventeen years. These cases were divided according to age and the number of recoveries in the following way:

Under 1 year	6,	of whom	1	recovered = 16.6	per cent.
1–4 years	12	,,	1	,, = 8.3	,,
5–14 ,,	61	,,	26	,, = 42.6	,,
15–19 ,,	23	,,	8	,, = 35.0	,,
20–29 ,,	34	,,	10	,, = 30.0	,,
30–39 ,,	27	,,	8	,, = 30.0	,,
40–49 ,,	15	,,	3	,, = 20.0	,,
50 years and over	32	,,	2	,, = 6.2	,,
All ages	210		59	28.0	,,

If the material is divided into groups as the meningitis was either uncomplicated or associated with other important intracranial diseases, the number of recoveries is as follows:

	Cases.	Recoveries.
Meningitis (uncomplicated)	115 ...	38 = 33.0 per cent.
Meningitis + sinus-phlebitis	42 ...	16 = 38.1 ,,
Meningitis + brain abscess	21 ...	4 = 19.0 ,,
Meningitis + subdural abscess ...	2 ...	0 = 0.0 ,,
Meningitis + subdural abscess + brain abscess	2 ...	0 = 0.0 ,,
Meningitis + sinus-phlebitis + brain abscess	15 ...	0 = 0.0 ,,
Meningitis + sinus-phlebitis + subdural abscess	6 ...	0 = 0.0 ,,
Meningitis + sinus-phlebitis + subdural abscess + brain abscess	7 ...	1 = 14.2 ,,
Total ...	210 ...	59 = 28.0

Chronic suppuration of the middle ear was decidedly more frequently the cause of benign meningitis than of malignant. Streptococcus infection was predominant in the benign cases, while pneumococcus infection played a comparatively important part in malign cases.

The benign forms of otogenic meningitis do not, however, appear only amongst patients who recover. In a series of cases of meningitis complicated with other intracranial diseases which ended in death, the meningitis was seen to disappear before death after having presented distinct objective meningitic symptoms.

Pathological Definition of Meningitis.

The usual definition of meningitis as a diffuse inflammation of the leptomeninges with the formation of a purulent exudate in the subarachnoidal spaces does not hold good in all cases, and the author quotes several examples of this from his own experience. Examples are especially quoted of cases where the cerebro-spinal fluid was distinctly meningitic, and where the macroscopical examination *post mortem* showed no exudate or other signs of inflammation of the leptomeninges, while the microscopical examination revealed the existence of inflammation of the leptomeninges. The paramount significance of lumbar puncture is emphasized.

Clinical Definition of Meningitis.

Based upon experience with about 2,000 lumbar punctures, the author gives a synopsis of the different characteristic features of the cerebro-spinal fluid in meningitis, and draws up two forms, from which there are, however, many exceptions:

	Cerebro-spinal Fluid.	
	Malignant.	Benign.
Appearance	Turbid.	Clear or opalescent.
Type of pleocytosis ...	Polynuclear.	Mononuclear.
Bacteria	Present.	Absent.
Pressure	Very high.	Moderately high.

As to the number of cells which constitutes a pleocytosis, the author has come to the conclusion that if there are three or more cells in each cubic millimetre, and if there are diffuse brain symptoms, meningitis is sure to be present. Three to fifteen cells must be considered as slight pleocytosis; 15 to 150–200 does not generally make the cerebro-spinal fluid turbid, and can be considered as moderate; while a number exceeding these figures must be considered as high pleocytosis.

Using lumbar puncture as a diagnostic means the author defines otogenic meningitis from a clinical point of view as an acute febrile brain disease, caused directly or indirectly by an acute or chronic middle-ear suppuration, exhibiting diffuse brain symptoms and a cerebro-spinal fluid with pleocytosis.

Lumbar Puncture not Infallible.

In this part of the paper the author deals with the exceptional cases, where there is a distinct contradiction between the benign character of the cerebro-spinal fluid emptied by lumbar puncture and the grave state of the patient. Three cases are especially mentioned of fatal uncomplicated meningitis where the cerebro-spinal fluid assumed a benign character *sub finem vitae;* in each case considerable plastic and thick exudates were found on the base of the brain at the *post-mortem* examination. In such cases it is easy to understand that the free connexion of the cerebral fluid with the spinal fluid has been interrupted, and the lumbar puncture principally indicates the state of the leptomeninges in the spinal canal.

Benign Uncomplicated Meningitis with Turbid Cerebro-spinal Fluid ("Benign Purulent Meningitis").

This group consisted of 22 cases, which all recovered. The average age was 23.6 years, the oldest 50, the youngest 2 years of age.

In all except one polynuclear cells were present in the cerebro-spinal fluid, predominating in 16 cases, while in 4 an equal number of both was present, and in 2 an excess of mononuclear cells. Bacteria were present only 4 times.

The initial symptom was generally vomiting, sometimes shivering. The temperature was never normal, but was in

a few cases only slightly raised, while in one-third of the cases it was 104° and beyond. Drowsiness was a very prominent symptom: deep sopor appeared twice. Rigidity of the neck was generally present, and so was Kernig's sign, while Babinski's sign only appeared five times. Optic neuritis was observed seven times. In one case a piece of the brain was removed for microscopical examination, which revealed the existence of a considerable acute leptomeningitis with fibrinous exudates on the surface (but no encephalitis as expected).

All these cases ended with complete recovery after operation, but in one case concerning a child aged 2 operation was refused and the child still recovered. This very rare and remarkable case shows that there may be a tendency to spontaneous recovery in some forms of otogenic meningitis.

Benign Uncomplicated Meningitis with Clear Cerebro-spinal Fluid ("Collateral Meningitis").

The 16 patients belonging to this group all recovered after they had been operated. They were on an average 20 years old, the oldest being 50 years old, the youngest 20 months.

The number of cells in the cerebro-spinal fluid varied from 3 to 198 per cubic millimetre; eight times only were mononuclear cells present; five times there was an excess of these, and three times an excess of polynuclear cells. In no case were bacteria found. The pressure was normal only twice, generally it was 300 to 500 mm., but in one case it rose to 950 mm.

The temperature was normal only twice; in the majority of cases it was slightly raised, and in five it was about 104°. Also within this group vomiting was frequently the initial symptom, and often appeared later in the course of the disease, even when the patient otherwise did well. Drowsiness is also an important symptom, though often slight and easily overlooked. Rigidity of the neck appeared eleven times, Kernig's sign only five times, while Babinski's sign was present six times. Five patients had optic neuritis; paresis of the abducent nerve appeared twice. The recovery often took a long time, the pleocytosis frequently disappearing very slowly.

As the true nature of this form of meningitis may be doubtful, the author proposes to call it "collateral meningitis," this name involving a distinct interpretation neither of the character nor the extension of the inflammatory process of the leptomeninges. Further, "collateral meningitis" expresses the dependence of the process upon a primary focus and also its tendency, like other collateral inflammations, to recede when the primary focus disappears.

Benign Meningitis in Cases of Sinus-phlebitis.

This group embraces 16 cases of recovery, of which 8 exhibited clear and 8 turbid cerebro-spinal fluid. The predominant formulæ was polynuclear. Bacteria were only found once. They all recovered completely, but one patient died a year after from uncomplicated meningitis originating from the other ear. The brain symptoms were often covered by the symptoms of the phlebitis.

In one case with slightly turbid cerebro-spinal fluid, microscopical examination of a piece of brain tissue extirpated during operation revealed the existence of considerable inflammation of the leptomeninges of the cerebellum. In several cases where there was a combination of sinus-phlebitis, which terminated fatally, and meningitis, the latter showed a benign character, being either very slight or disappearing entirely before death. In two cases of collateral meningitis as complication of lethal sinus-phlebitis, the *post-mortem* examination showed no macroscopical signs of lepto-meningitis, while the microscope revealed the existence of this complication.

Benign Meningitis in Cases of Brain Abscess.

The cerebro-spinal fluid obtained by lumbar puncture was generally of a benign character. The principal feature of the cerebro-spinal fluid is, however, that it changes from one lumbar puncture to another, being now clear and now turbid, now containing principally polynuclear cells, and at another lumbar puncture mononuclear cells principally, etc. Whether uncomplicated brain abscess may give a meningitic cerebro-spinal fluid by lumbar puncture must still be *sub judice*.

Operative Measures.

The most important factor is, of course, the *early* elimination of the primary focus, whether this is in the middle ear alone or also in the petrous bone, the labyrinth, etc.

But in many cases even an operation performed as early as possible is not able to avert the fatal course of the disease. There seem to be really two forms of otogenic meningitis. In the one, and by far the most frequent, the inflammatory process in the leptomeninges spreads like the explosion of a barrel of gunpowder ignited by a spark, and any operative measure is useless. In a minority of cases, say one-third, the spark—that is, the inflammatory products from the primary focus—is not able to cause the explosion before the fire has been nourished for some time from the focus. If in such cases the latter is eliminated, the further feeding by inflammatory products ceases, and the nascent inflammation of the leptomeninges recedes.

This idea has been the author's principal guide during the last decade in operative treatment of otogenic meningitis. For seven years previously all sorts of supplementary operations were tried. The author now considers them not only as useless but even as injurious, and the results seem to be better now.

As, however, craniotomy involves no danger when the dura mater is not opened, this operation is to be recommended to enable the operator to examine the dura minutely. If this membrane shows no sign of a deeper-going disease, the author now always makes a halt here, when there is no suspicion of subdural or cerebral abscess.

Formerly the author always performed "radical mastoid operation" also in acute cases in order to examine the labyrinth minutely; now only simple mastoid operation is performed in acute cases, as we nowadays possess means of accurately testing the function of the labyrinth.

Repeated lumbar punctures the author considers not only useful as means of following the decrease or increase of the meningeal process, but also beneficial, especially when the pressure of the cerebro-spinal fluid is very high or the patient is suffering from severe headache or nausea.

DISCUSSION.

Mr. FRANCIS MUECKE had always looked on aural meningitis as an almost fatal condition, and was surprised at the author's excellent statistics. He would like to mention a method he used lately in a case of meningitis with advanced symptoms. He inserted a tiny gauze wick through a very small hole in the dura above the tegmen antri and another behind the sinus into the posterior fossa, changing them every day for four days, when all meningeal symptoms had disappeared and an ordinary mastoid recovery took place. He only mentioned this so that others might try it if they wished and see whether this case were a lucky chance or not.

Dr. W. S. SYME had three cases of recovery from what was generally called purulent meningitis. In two this result followed translabyrinthine drainage. In both the cerebro-spinal fluid was very turbid, but no organisms were found, nor did any grow. These two cases might be classed as serous meningitis, though it seemed difficult to imagine that so turbid a condition of the spinal fluid could be found in that condition. The third case was more difficult to understand. This case recovered after repeated lumbar puncture. In the fluid organisms were found, but these did not grow. It seemed to him that in that case a definite bacterial meningitis had to be dealt with which recovered. From that case it seemed to follow that, treated early, it was possible for a case of definite purulent otogenous meningitis to recover.

Mr. T. RITCHIE RODGER said that Professor Mygind had succeeded in producing a very different atmosphere from that of the Newcastle discussion on the same subject last year. There the discussion resolved itself into that of the different methods of draining the meninges, and the impression conveyed was that the sooner this was done the better, if meningeal symptoms were present at all. Professor Mygind, however, recognized that evacuation of the primary forms in the antrum or middle ear might be followed by rapid recession of the symptoms of meningeal irritation. This could be easily understood if we thought how frequently we found acute mastoid cases with tenderness and oedema over the mastoid process, and oedema of the superficial mastoid cells, but no pus till the antrum was reached. If a drop of pus in the antrum could produce such marked collateral symptoms at a distance of an inch on its superficial aspect, what was to be expected on the far side of the tegmen antri? Was it not likely that there oedema and serous effusions could be presumed, designed by nature for protective purposes, but capable

in certain cases of producing symptoms of irritation, even of pressure? He had had two such cases where draining of the mastoid antrum was followed in a few hours by clearing up of the meningeal symptoms, and both of these cases showed the Kernig and Babinski signs confined to the opposite side of the body, a restriction to which Professor Mygind had referred as occurring in some cases.

IS IT WORTH WHILE TO REMOVE AURAL POLYPI?

BY

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THIS paper is based mainly on the results obtained by the removal of aural polypi during the period 1915 to 1921 at the Ear and Throat Department of Edinburgh Royal Infirmary, under the charge of Dr. Logan Turner.* It should be stated that during the years 1907 to 1910 aural polypi were, as a rule, removed in the out-patient department by means of the cold wire snare, and thereafter the patient was instructed to carry out the usual conservative treatment of chronic middle-ear suppuration by means of syringing and the use of spirit drops. The results were not satisfactory, as in almost all cases the polypus returned. It was therefore at this time considered useless to continue treatment on these lines, and accordingly patients suffering from chronic middle-ear suppuration with aural polypus were, as a rule, advised to submit to the radical mastoid operation. It was found, however, during this operation that in some cases there was little or no disease in the mastoid antrum and that the malleus and incus were healthy. As a result of this finding it was determined to give a further trial to removal of aural polypus through the external meatus. (It is important to note that the term "aural polypus" is used to indicate only cases in which there is a definite projecting polypoid growth. Cases in which a large perforation was present and the inner wall of the tympanic cavity was seen to be covered by red "granulations" are not included.) Removal of the polypus allows the surgeon to see the site of the perforation in the drumhead and the type of middle-ear suppuration present. If the perforation is central, then we may hope for a cure of the suppuration by means of conservative treatment after removal of the polypus. If, on the other hand, the perforation is marginal or in Shrapnell's membrane, then we cannot expect a good result from removal of the polypus alone.

Technique of Removal.

The methods employed in the removal of aural polypi can be divided into two groups: (1) In the early cases of the present series Neumann's local anaesthesia was employed alone, and the polypus was removed with the cold wire snare and ring knife. (2) Later, a general anaesthetic (ethyl chloride) was employed in addition to Neumann's local anaesthesia, and the stump of the polypus was cauterized by means of a chromic acid bead. After removal of the growth the ear was treated daily, first of all with hydrogen peroxide drops; secondly, by syringing with a dilute solution of lysol (half a teaspoonful to the pint of lukewarm water); thirdly, by drying out the meatus with cotton mops; and, lastly, by the instillation of boric acid in rectified spirit. Before the polypus was removed, the cochlear and vestibular apparatus were tested to make sure that the inner ear was healthy and that no symptom of fistula was present.

During the years 1915 to 1921 there attended the Ear and Throat Department of the Edinburgh Royal Infirmary 2,072 cases of unilateral and 685 cases of bilateral chronic suppurative otitis media, giving a total of 3,442 suppurating middle ears. In 102 of these cases aural polypi were removed.

We have attempted to find out the frequency of aural polypus in chronic middle-ear suppuration, and for this purpose have taken the period 1915 to 1917 (inclusive), during which 1,430 chronic suppurating middle ears were investigated at the department. Of these, 311 showed aural polypi—that is, 22 per cent.

* The writers are indebted to Dr. Logan Turner for permission to publish the results.

Results Obtained by Removal.

Of the 102 cases in which the aural polypus was removed 70 reported after a period sufficient to enable us to say whether the operation had been successful. The results of removal may be classified into three more or less distinct groups: (*a*) those in which the removal of the polypus, followed by conservative treatment, resulted in cure—that is, cessation of discharge and non-recurrence of the polypus—15 cases, or 22 per cent.; (*b*) those in which there was no recurrence of the polypus but in which the ear continued to discharge in spite of conservative measures—15 cases, or 22 per cent.; (*c*) those in which there was continued discharge from the ear, associated with recurrence of the aural polypus—38 cases, or 54 per cent.; (*d*) there were two deaths. These are dealt with later.

Site of Origin of the Polypus.

Kerrison states that, while occasionally springing from the promontory, this site is exceedingly rare as compared with the outer wall of the vault or the diseased inner end of the bony meatus. McBride, Hunter Tod, Politzer, Gleason, Barr, and others agree, on the whole, that the commonest site of origin is some part of the inner wall of the tympanic cavity. In a previously published report on the radical mastoid operation (*Journal of Laryngology*, 1919, vol. xxxiv, p. 373) one of us (J. S. F.), in conjunction with Dr. Garretson of Detroit, U.S.A., stated that of 156 cases in which the condition of the tympanum was noted at the time of operation, in 69 there was a polypus growing from the promontory and in three from the attic.

Of the 102 cases of the present series in which an aural polypus was removed 31 came eventually to the radical mastoid operation. As far as could be ascertained, the site of origin of the polypus in these cases was as follows: inner wall of tympanum, 16; attic, 2; doubtful, 13. The 13 cases where the site of origin could not be stated definitely belonged to the group in which the aural discharge continued without the recurrence of the polypus. In 9 of the 31 cases which came to the radical mastoid operation cholesteatoma was found in the middle-ear spaces at operation.

Dangers Associated with Aural Polypi.

(*a*) *Danger of Mastoid and Intracranial Complications.*—Packard and others have stated that obstruction by aural polypi to the escape of discharge increases the risk of mastoid and intracranial complications in chronic suppurative otitis media. In the report by Fraser and Garretson (mentioned above) it was noted that the tympanic membrane was obscured by a polypus in 129 out of 248 cases of chronic middle-ear suppuration in which the mastoid operation was performed. Further, an aural polypus was present in 8 out of the 25 cases of intracranial complication, and in 21 out of 26 cases with labyrinthitis recorded in the paper. There seems to be little doubt, then, that the presence of an aural polypus in a case of chronic middle-ear disease is at least a predisposing cause of mastoid, labyrinthine, and intracranial complications.

(*b*) *Danger Connected with Removal of Aural Polypi.*—In two of the 102 cases recorded above removal of the polypus was followed by the death of the patient. The clinical records of these two cases are as follows:

CASE I.

D. R., male aged 58, was first seen on February 16th, 1918, suffering from chronic suppurative otitis media (bilateral). Both drumheads were obscured by large polypi. With the noise apparatus in the left ear the raised voice was heard close to the right ear; hearing in left ear similar. On February 20th, under Neumann's local anaesthesia and general anaesthesia by ethyl chloride, polypi were removed from both ears. The patient became restless when recovering from the anaesthetic. At 3.30 p.m. he became unconscious, with paresis of the left side. He died the next day.

Post-mortem Examination.—Atheroma of the cerebral arteries. There was a large haemorrhage into the basal ganglia on the right side of the brain. Death in this case was not directly associated with the removal of the aural polypi but with the atheroma of the cerebral arteries.

CASE II.

J. M., female aged 27, was first seen on June 6th, 1919, suffering from chronic suppurative otitis media (right) with polypus. With noise box in left ear the raised voice was heard at one foot. Rotation both to right and to left produced after-nystagmus of twenty seconds' duration. On July 3rd a polypus was removed from the right ear. The next day the patient was well and was discharged. On her return home she developed a rash (diagnosed as scarlet fever) and died within a short time. She had no sore throat at the time of admission, but was apparently operated on during the incubation period of scarlet fever.

A third case, although it did not occur during the period under examination, is we think of sufficient interest to deserve mention. The record has been previously published in the *Proceedings* of the Royal Society of Medicine, 1916, vol. ix (Otological Section), p. 75.

CASE III.

C. G., female aged 6, had discharge from the left ear following an attack of measles at the age of 3 years. On December 25th, 1911, she had severe pain in the left ear, followed by vomiting, dizziness, and headache. (This was probably an attack of labyrinthitis.) The symptoms gradually improved, and by January 8th, 1912, she was fairly well. When seen for the first time, on January 13th, the left external meatus contained pus and polypoid granulations. There was no mastoid tenderness. The tonsils were enlarged and a mass of adenoids was present. Adenoids and tonsils were removed on January 15th. Unfortunateiy, at the same time the granulations in the left ear were also curetted, a procedure which should be strictly avoided unless the labyrinthine function has been tested and found normal. On January 17th, 1912, the patient was cyanosed and vomiting: temperature 103.2° F., pulse 160. Next day complete deafness was noted in the left ear; giddiness was present; there was rotatory and horizontal nystagmus to the sound side (right). The pulse was feeble, the tongue furred, diarrhoea present. The cerebro-spinal fluid was under increased tension but clear; films showed streptococci and bacilli. Operation was considered hopeless. On January 19th antistreptococcus serum was given; facial paralysis was noted on the left side, and death ensued.

Post-mortem Examination.—Cloudy swelling of kidneys, heart, and liver; petechial haemorrhages in lungs; the mesenteric glands showed recent acute inflammation in addition to chronic enlargement. No obvious meningitis. The appearances were those of acute septicaemia.

The case appears to have been one of septicaemia and malignant serous meningitis following removal of tonsils and adenoids and curettage of ear granulations in a patient suffering from latent labyrinth suppuration. Microscopic examination of the left ear confirmed the presence of labyrinthitis.

Conclusion.

In a case of chronic middle ear suppuration, with aural polypus, if (1) there are no acute symptoms (earache, headache, mastoid tenderness, giddiness, vomiting, shivering, etc.), (2) the labyrinth is found to be healthy on functional examination, and (3) it is possible for the patient to have efficient conservative treatment, we hold that it is advisable to remove the polypus through the external meatus in the first instance. If the growth recurs after efficient removal followed by careful after-treatment, the radical mastoid operation is called for.

DISCUSSION.

Dr. HOLGER MYGIND said that he had had a few unpleasant experiences connected with the removal of polypus of the ear. In one case a facial paralysis occurred at once after the removal, and in two other cases labyrinthitis with loss of hearing appeared directly after the operation. He did not think, however, that such cases should prevent surgeons from removing polypi; he always did it in cases where it was not a polypus recurring after having been removed by a competent specialist; in such cases radical operation was to be recommended.

Sir JAMES DUNDAS-GRANT said that as a matter of routine he insisted on the instillation of drops of zinc chloride and alcohol for a week before the removal of a polypus when it was bathed in pus. He recalled a case in which, after the removal of what seemed to be a granulation polypus, the symptoms of an existing cerebellar abscess developed. For the examination of the labyrinth he recommended the case of his own "cold-air" apparatus. The removal of polypi was decidedly important.

Sir WILLIAM MILLIGAN attached great importance to antiseptic treatment of the meatus and middle ear for a week before the removal of an aural polypus.

Dr. J. S. FRASER, in reply, said: I agree with the President that it is very difficult to state with accuracy the site of origin of the aural polypus in many cases. With regard to the danger of removal of the polypus, I can only say that I have, fortunately, not met with any cases of facial paralysis or of uncontrollable bleeding as a result of this small operation. I fail to understand the stress Sir William Milligan lays on the importance of antiseptic treatment before removal. In a great many cases the polypus is really acting as a tight cork in the external meatus, and I do not see how one is going to render antiseptic the inner end of the meatus, much less the tympanic cavity and other parts of the middle-ear cleft. I am glad that most of the speakers agree that it is advisable to remove polypi in uncomplicated cases; just as every dog is allowed one free bite, so I think an aural polypus may be allowed one removal, granted that the labyrinth is healthy and that there are no acute symptoms.

SECTION OF LARYNGOLOGY.

JOHN MACINTYRE, M.B., C.M., F.R.F.P.S., President.

DISCUSSION ON DISEASES OF THE OESOPHAGUS, THEIR SYMPTOMATOLOGY AND DIFFERENTIAL DIAGNOSIS.

OPENING PAPERS.

I.—AFFECTIONS OF THE SUPERIOR OPENING OF THE OESOPHAGUS.

BY

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MY first and pleasing duty is to express my thanks for the honour you have done me in asking me to open this discussion. At the London meeting of the Association in 1910 I had the privilege of taking part in introducing a discussion in this Section on the technique of the direct examination of the oesophagus, then in its earlier stages. Since that time a great deal of work has been done on the subject of oesophageal disease in which members of this Section have taken a conspicuous part, and it is perhaps not inappropriate to-day to indicate in a short survey some of our advances and some of the problems which still await solution. For this purpose it has been thought desirable to approach it from the clinical side with a view to making an attempt to assess the value of symptoms as they appear to the practitioner in his daily work. In discharging the duty laid upon Mr. Howarth and myself we have thought it might be of advantage if I confined myself mainly to affections of the superior opening of the gullet whilst he dealt with those of the lower segment. This is not an ideal division, but it has certain practical advantages, as each section presents some special features of its own. It will be understood, therefore, that the following remarks are concerned chiefly with the upper orifice.

The semeiology of oesophageal disease is comparatively simple. What may be termed the oesophageal syndrome consists essentially of two symptoms—dysphagia and regurgitation of food. The gullet plays an active part in the mechanism of deglutition, the maximum effect of the movement being produced where the sphincter fibres are most developed—namely, at the entrance and at the lower end. It is, however, a canal of transmission, and anything which interferes with the movement of food may produce difficulty of swallowing or dysphagia. This is a condition common to all diseased states of the gullet, and is generally the initial symptom. Its onset may be gradual, commencing with difficulty in passing solids, extending later to semi-solids, then liquids, and finally, it may be, to complete inability to swallow. Where the seat of obstruction is high up at the orifice of the canal, fits of coughing are apt to accompany the attempt to swallow from food finding its way into the air passage, making the patient nervous and disinclined to eat, except in small quantities. On the other hand, the appearance of dysphagia is sometimes sudden and often related to spasm. This may be transitory and very variable, appearing and disappearing suddenly, though in cases where it is well established it may become more or less permanent. Dysphagia may thus be due to organic obstruction or to spasm at the superior opening, or to a combination of both; for it is not unusual—for example, in early malignant disease—to find an element of spasm which is largely responsible for the dysphagia. Its onset in a hitherto healthy person is always important and its significance should not be overlooked. In certain general states—for example, where there is pronounced anorexia—there may be disinclination, amounting to declared inability, to swallow, and a somewhat similar condition may likewise be met with in certain neurotic states, but as a rule there is not much difficulty in their differentiation. On the other hand, where dysphagia is not very pronounced and attention is monopolized by the presence

of a prominent external swelling such as enlarged cervical glands or infiltration of the thyroid, its presence may be overlooked, and instances are not unknown where such secondary glands have been removed and the thyroid operated on in ignorance of the primary disease in the gullet—a diagnostic pitfall, one need hardly say, to be avoided. It must of course be borne in mind that difficulty of swallowing may be due to other affections, such as post-diphtheritic and bulbar paralyses, retropharyngeal abscess, tuberculous and malignant disease of the larynx, cicatricial malignant obstruction of the hypopharynx, even to pressure by external tumours; their differentiation, however, does not as a rule remain long in doubt.

Regurgitation of food may be a sign of considerable value. If it takes place at once and the food returns unaltered, it points to the seat of obstruction being high up. The regurgitation of fragments of food undigested, after several hours or days, is of course diagnostic of a pharyngeal or pressure pouch.

Of the symptoms of less value, painful sensations, such as burning in the region of the larynx, a feeling of tension or constriction, etc., are not uncommon. More significant is more or less continuous pain, increased by swallowing, in the region of the cricoid—a symptom often associated with malignant disease. With it there may be pain in the ear, often distressing and difficult to relieve, and probably to be explained by the intimate relations of the facial and glossopharyngeal nerves. When this occurs in dysphagia of long standing it too often indicates the supervention of grave disease in the lower pharynx or cricoid region.

Salivation sometimes attracts attention. It may be reflex from a traumatic lesion around the introitus, or due to great obstruction there, as by the impaction of a foreign body. In well-established malignant disease it may be profuse and productive of great discomfort. The clinical picture of a patient mopping the saliva from the lips with a towel is familiar to most of us. A most distressing instance of this nature which came under my own notice was a young married lady, six months pregnant with her first child, and suffering from advanced malignant disease in the post-cricoid region.

Of the physical examination in such cases I need say but little. Careful palpation of the neck and the region of the larynx should be carried out. Internal palpation is often of great value, for it ought not to be forgotten that disease in the hypopharynx is within reach of the finger. The laryngeal mirror is indispensable in ascertaining the presence or absence of disease in the post-cricoid region and should always be made use of in the first instance. In many cases it may establish the diagnosis at once. With its aid the upper margin of a growth may be visible. The advantages of radioscopy are well known to you. The fluorescent screen is invaluable in the preliminary examination. With the patient in the oblique position—that is, with the head and upper part of the body turned half-way to the left and the right shoulder in contact with the screen—the dense shadows of the spine and of the heart and aorta are displaced and a good picture of the bismuth meal obtained. We can get a clear and distinct view of the hypopharynx and much useful information of the way in which the bolus behaves at the mouth of the gullet. Even a new growth may be outlined by the small particles of bismuth arrested in its fissures and erosions. I need hardly emphasize the value of an *x*-ray installation as a normal adjunct to a modern throat clinic. Some Continental hospitals are already ahead of us in this.

As a diagnostic means the use of the bougie in a blind fashion is not to be recommended. Its value is not great, it tells us much less than other more accurate methods, and it is not without danger in certain states. Personally I always like to reconnoitre well the local condition before using the bougie for the purposes of treatment.

On the value of endoscopy it is unnecessary to enlarge. It is now well established as a routine method in the examination of the oesophagus. We know its advantages and its limitations, and as a specialty it is permissible to congratulate ourselves and claim some measure of credit for making an important contribution to practical medicine. Its later development—suspension laryngoscopy—is especially adapted for investigation of the post-cricoid region.

If we now consider shortly some of the more important affections of which the above symptoms are an outward expression, it would be well to remember that the element of spasm plays an important part in many morbid conditions of the gullet. It runs through all its pathology, though there has perhaps been a tendency to exaggerate it as a primary condition. Symptomatic spasm we are familiar with in such general states as hydrophobia, tetanus, and in certain poisons. The endoscope has taught us that a spasmodic stricture of the upper opening may be secondary to a small local lesion such as an ulcer or the impaction of a fish bone. It may even have a more distant cause, and I have had the experience, like some of my colleagues, of regarding a spasm at the cricoid opening as primary and overlooking for a time the presence of graver disease at the lower end of the canal of which it was but a reflex expression. Spasm may thus be the outcome of a simple or a serious lesion, though the resulting dysphagia may be equally marked in both.

Of the group of spasmodic dysphagias in which no local exciting cause can be made out, those of a more or less temporary character are not infrequent. They occur chiefly in young people, generally of the female sex. Their onset is usually sudden, often accompanied by choking attacks, and they usually pass off equally rapidly. Dysphagia is rarely complete and usually limited to solids. Emotional states are often the exciting cause, and it is commonly regarded as a manifestation of hysteria. The fluorescent screen may show a little holding up of the meal which the endoscopic tube shows to be due to a certain degree of spasm at the mouth of the gullet.

Of greater importance are cases where spasm at the upper opening occurs in women, usually about middle age. Dysphagia here is prominent, and may be the only symptom for years until loss of weight, anaemia, characterized by diminution of haemoglobin, and poor health set in. A long history is frequent and characteristic; it may date from ten, fifteen, or even thirty years. The patient has "a small swallow," she takes progressively longer at meals until it becomes a social disability. The passage of a tube may relieve it for a time, but it often gradually returns. Occasionally its beginning may be sudden—for example, in several cases under my own care it came on after a complication of childbirth, such as severe flooding. As a rule the patient has no doubt as to the seat of obstruction, which she refers to the region of the larynx. A certain degree of variation in the dysphagia may be noted; swallowing may improve for a time, only to be affected again by an intercurrent illness. This variation is apt to deceive the practitioner, who regards the patient as fanciful, and leads him to make a diagnosis of hysteria, for which there is rarely justification.

On a former occasion I dwelt on its not infrequent association with changes in the buccal and pharyngeal mucosa. From the smooth glossy upper surface of the tongue with whitish patches, and a tendency to dryness in advanced cases, it has been termed chronic glossitis, but it is important to note that this change is by no means confined to that organ, as the mucosa of the mouth, pharynx, and even the upper section of the oesophagus is likewise nearly always involved. This change does not seem to be related to nasal disease—it is absent from the larynx; in short, it is an affection of the upper food passage.

In this type of spasmodic dysphagia the bismuth meal is arrested at the mouth of the gullet. Swallowing movements may be seen to allow only small portions at a time to escape through, the picture on the screen being interesting and instructive. With regard to the appearances seen by the endoscope I am in entire agreement with the description given by Brown Kelly. The rigidity of the tissues at the upper opening, characteristic of spasm, is a notable feature, and the thin mucosa may crack and bleed even on careful examination. In my experience such cases are entirely confined to women not by any means emotional or to be regarded as neurotic or hysterical, and the association of this dysphagia with the mucosal changes above alluded to is a subject worthy of consideration. Do the changes in the mucous membrane lead in some way to interference with the reflex movement of swallowing and so call forth spasm? It is within our knowledge that injury to the pharyngeal mucous membrane—for instance, by scalding—may sometimes be associated for a period with difficulty of swallowing. The time has come, I think, to claim for this clinical type of spasmodic dysphagia an entity of its own, to point out its essentially chronic course, its limitation to the female sex without being a manifestation of an hysterical state, the possibility of its material relief by suitable treatment, and the clinical fact which I shall allude to presently, that it may be the precursor of malignant disease in the post-cricoid region. Until this is done and its position clearly defined, it will continue to be misunderstood, with regrettable consequences both to

patient and practitioner. This service I commend to the Section.

The commonest cause of dysphagia due to an organic lesion is malignant disease at the upper opening, which is almost always squamous-celled epithelioma. Here an interesting parallel may be noted with dysphagia of the spasmodic type. Both affect the superior opening very frequently in the female sex. They are comparatively rare at this site in men, in whom the incidence of malignant disease increases as we descend the oesophagus. Carcinoma is met here at a much earlier age in women; I have found it in a woman of 23. Its duration is said to be much longer, but here we are faced with the undoubted clinical fact that spasmodic dysphagia in women sometimes terminates in malignant disease. The earlier stage of the not uncommon long history in such cases is almost certainly referable to a state of spasm. I have been able on more than one occasion to determine the presence of spasm and to relieve it for a time, even some years, by the passage of a tube, and to find later the increase of dysphagia with pain and loss of flesh explained by the supervention of malignant disease in the post-cricoid region. In more than one such case the patient could assign a comparatively recent date for the alteration in her condition.

Logan Turner's statistics clearly establish that while cancer in the tongue and in the lower oesophagus is much more common in men, it shows a striking tendency in women to affect the mucosa of the oral pharynx and hypopharynx. Here again I would direct attention to the similar distribution of chronic glossitis, and raise the question whether they are related conditions. The liability of this affection in the tongue to result in epithelioma is recognized by surgeons, and there is no reason why it should not do so lower down.

In the diagnosis of carcinoma of the post-cricoid region examination by the laryngeal mirror will reveal its presence in a large proportion of cases. The upper margin of growth may be visible, or deeper-seated disease may be revealed by impaired mobility of the vocal cords. The fluorescent screen is helpful in determining the presence of such a growth and in outlining its extent downwards. Where the presence of a tumour has been ascertained we ought not to forget that the finger may be a useful means of determining its character. By means of the endoscope and suspension laryngoscopy more complete information may be gathered as to its relations and extent.

Of dysphagia produced by cicatricial contraction the result of traumatism by a foreign body or swallowing caustic fluid or from syphilitic ulceration little need be said. The etiology taken in conjunction with the local appearances seen by the endoscope will usually suffice to establish the diagnosis.

Regurgitation of food is the prominent symptom in a pressure pouch, often called oesophageal pouch, though its point of origin is always in the hypopharynx, above the upper opening of the gullet. Here the return of food is a constant sign, part of the meal being regurgitated unaltered after some hours or even days. Swallowing often produces a gurgling noise in the throat. As the pouch is nearly always on the left side fullness of the neck on that side may be noticeable and pressure over it elicit gurgling. The fluorescent screen after a bismuth meal gives a characteristic outline of the pouch, which may be more carefully explored by the endoscope tube.

This completes a short survey of the more important affections met with at the superior opening of the gullet. The problems presented by them are of the greatest importance from the standpoint of practical medicine. I have necessarily confined my remarks to a few; others will doubtless occur to members of the Section, and I may express my confident belief that discussion of them by a body of observers possessing special training and knowledge will materially contribute to their solution.

II.—AFFECTIONS OF THE LOWER SEGMENT OF THE OESOPHAGUS.

BY

WALTER G. HOWARTH, M.A., M.B., F.R.C.S.,
Surgeon to the Throat Department, St. Thomas's Hospital.

OF late years our knowledge of the oesophagus has in certain directions advanced enormously, and from time to time an intensive focus has been directed on certain aspects of oesophageal disease. Your Council has now thought that the time has arrived when we should make a more general survey and crystallize our ideas with a view to arriving at some consensus of opinion with regard to symptomatology and differential diagnosis of the various diseases that arise in this region. Everyone will, I think, agree that it is very important that such a step should be taken; but there can be none, I imagine, who will under-estimate the difficulties of such a task.

The organ with which we have to deal is a tube of singular complexity when its developmental history, its variety of muscular structure, and nervous control are considered, whilst anatomically and physiologically its exact limit, at least as regards its lower end, is singularly difficult to determine. Moreover, it is placed so deeply and in such close proximity to so many important structures that a number of external considerations must inevitably be taken into account. These facts may help to explain to some extent why the normal physiology of its working is even now by no means agreed upon.

Under such conditions the investigation of pathological phenomena is apt to be fraught with many difficulties. Dr. Paterson has dealt with oesophageal disease mainly as it affects the upper part, and though it is impossible satisfactorily to divide the subject in such an arbitrary way, I propose to consider generally the lower half. The manifestations of disease in this section of the gullet are usually due to cicatricial or compression stenoses, to the various forms of malignant disease, or are a complex variety of phenomena of nervous origin. Let us consider in the first place the symptoms that we may meet with in such conditions.

In all types—I do not say in all cases—dysphagia is in the forefront of the picture; this may or may not be attended with pain, usually referred to the cricoid or to the back of the lower end of the sternum. Regurgitation of swallowed food, if not actual vomiting, is usual. Irritable, useless cough may be present, whilst persistent hiccup, choking sensations, and a feeling of suffocation are often noted.

Excessive salivation is often troublesome, and this is sometimes blood-stained in character.

If the condition is at all prolonged, inanition may be a prominent feature, but marked cachexia is seldom seen.

When we come to the interpretation and relative value of these symptoms, difficulties begin to arise. Select from and group these symptoms how we will, it is impossible to present a clinical picture that is pathognomonic of any single condition. Any of them or practically all of them may be absent.

Dysphagia, usually a prominent symptom in malignant disease, may be entirely absent, as it was in one of my patients, whose only complaint was of incessant cough and occasional suffocation attacks. He had a left recurrent paralysis, and oesophagoscopy confirmed the diagnosis of malignant disease; but it remained for the *post-mortem* examination a few weeks later to reveal that the anterior wall of the oesophagus from the aorta to the cardia was a mass of growth. And then again dysphagia may be out of all proportion to the size of the growth, for we know that in obstruction due to ulceration resulting from new growth there are two factors to be taken into consideration—the organic lesion itself and the spasm induced thereby. Very often the latter is responsible for nearly the whole of the symptoms.

The character of the dysphagia may be helpful, and dysphagia to solids is more usual in organic strictures and dysphagia to fluids in achalasia and allied conditions, but this is not always so. The most useful point to note about dysphagia is, I think, its variability. Dysphagia varies more often and over a wider excursion in nervous phenomena than in organic disease. This is, I think, generally true, and yet we can recall cases of cicatricial stenosis in which periods of marked disability alternated with periods of comparative ease. Persistent hiccup may be a valuable early symptom in malignant disease, and I have known it precede any other by three weeks, but I have also known it as the first sign of all in achalasia.

A point of considerable clinical interest is the frequency with which the earliest symptoms of disease in the lower half of the oesophagus are referred to the upper end, so that sudden choking attacks at the beginning of a meal may be the first warning of disease in the phreno-cardiac segment. I have mentioned on a previous occasion cases of such a nature where the disease was entirely below the diaphragm.

Symptoms, however helpful they may be, are, we are told, merely disordered reflexes and so may be initiated from any portion of the tube and by a variety of stimuli, so that in our

endeavour to arrive at an exact diagnosis we must have recourse to other methods of investigation. The most helpful are *x*-ray examination, oesophagoscopy, and the use of the bougie under direct vision. The time has surely passed when the crude barbarity of pushing a bougie blindly into the oesophagus could be contemplated.

X-ray examination should, I think, always be conducted at the fluoroscopic screen. After the general thoracic survey has been completed in the upright position, the patient should be turned into the right half lateral position for the oesophageal examination. The value of careful and prolonged examination at the screen is very great and should always be conducted under the supervision of the surgeon himself. For this purpose, thickish bismuth emulsion is probably the best; the bismuth cachet seems to me to be not only valueless but misleading, owing to the abnormal spasm that it so often excites.

In the diagnosis between organic and functional stenosis at the lower end the shape that the bismuth takes is important. In the nervous group the shadow is very broad, regularly conical, or with a round end that bends to the left and projects somewhat below the cupola of the diaphragm; often no spot of bismuth passes into the stomach, even if examined for half an hour.

The conical form may sometimes be difficult to distinguish from malignant stenosis, but in the latter the cone is not of a regular smooth outline, but is often irregularly notched and funnel-shaped: moreover, there is usually a gradual leakage of bismuth into the stomach. A point that may be useful is the injection of atropine or papaverine. In one case in which we often watched the bismuth held up at the phreno-cardiac level for half an hour, dilating the oesophagus above it, the hypodermic injection of 4 grains of papaverine caused almost immediate relaxation, and the whole of the bismuth was in the stomach within five minutes. Atropine is apt to be disappointing, but I doubt if we use it in anything like large enough doses.

Another point that may be helpful: as the oesophagus turns forward and to the left to enter on the diaphragmatic part of its course there is a triangular space behind it. In malignant cases this space is often obliterated, whilst in spasmodic cases it is usually clear. It is, however, on oesophagoscopy that we must rely for the more exact diagnosis of many conditions, as by it alone can we determine the nature of the mucous membrane and the exact situation of any obstruction.

The characteristic white, firm, yet elastic web, often with extra fibrous strands stretching to the oesophageal wall, is typical of the cicatricial stenosis, and its level is readily ascertained, whilst compression of the oesophagus from outside, though often difficult to differentiate from intramural growths, may be conjectured from the deviation of the lumen, the shape of the slit, the mobility of the mucosa, and other appearances. In this connexion valuable help may ensue from the inflation of the oesophagus with the aid of the Mosher oesophagoscope.

The most difficult, and in some ways the most interesting, part of the investigation concerns the differentiation of the various forms of stenosis that are met with quite at the lower end of the oesophagus. Here our main task is to distinguish between organic obstructive lesions with dilatation above them, and the dilatations that result without anatomic stenosis.

It is outside my province to discuss the actual site of the obstruction in the various forms of non-anatomic stenosis, or to mention the relative importance of extrinsic or intrinsic factors; but it would be as well to suggest that achalasia, cardiospasm, hiatal oesophagismus, and other suggestive names do not connote definite diseases, but are merely manifestations of local or general disease which have led to a dysfunction of the vegetative nervous system whereby the normal reflex sequence is interrupted and the interdependent musculature of the hiatal oesophagus and the cardia put out of gear.

Even when we have diagnosed the occurrence, the interpretation thereof may be very far to seek, but this, too, may be at least helpful in turning our attention to other organs or systems for analogous phenomena and possible explanations.

These manifestations are, I think, far more common than is usually supposed and the etiology singularly obscure. This latter need not detain us now, but we should, I think, try to come to some definite conclusions as to the variety of oesophagoscopic appearances and the range of abnormality that they present.

In the long-standing well-marked case we are all familiar with the pendulous oesophagus, often sagging to the right, the mucosa thrown into folds and inflamed by the presence of the stagnant food, particles of which adhere to the walls; but when we turn our attention to the region of the hiatus the conditions that we meet with are apt to vary, and there seems to be but little agreement as to what is a typical picture.

The appearance at the hiatus, its rhythm of opening and shutting, the influence of cocaine, of acids, alkalis, and other stimuli upon it, the presence of hyperaesthetic areas and the effect of their stimulation, are all points about which we have not nearly enough systematic recorded investigations, and without which we are like sailors in an uncharted sea. At the present time these cases are coming to us for investigation at a much earlier stage, often before any great degree of dilatation has taken place, and it is, I think, from the careful investigation of these rather than from the very long standing ones that one is likely to learn the most.

Time does not permit of more than a brief mention of malignant disease, though this unfortunately provides the great bulk of the cases that we are asked to see. When fungating and projecting into the lumen of the oesophagus, the friable, freely bleeding growth presents few difficulties in diagnosis. It is the firm infiltration, sometimes localized but often diffuse, of the intramural growth that is the difficulty, and here it is that the fine bougie is particularly helpful, not only in detecting an eccentric position of the hiatus, but also in appreciating the kind of resistance that is met with, and whether or no it is possible to overcome it by gentle pressure and reach the stomach. In some cases the hiatus seems pushed up towards us as though bulged by the pressure of a firm collar, and though this condition has, I think, been described as occurring in old-standing spasmodic cases, it is, in my opinion, more commonly seen when there is a malignant growth of the subhiatal region bulging the diaphragm from below.

There is one clinical point that I should like to mention, though it is not an oesophagoscopic appearance, and that is the extraordinary frequency with which cancer of the oesophagus is associated with foul septic teeth. Looking through one's cases it is really remarkable how close is the association.

Of other conditions that are found in the lower end of the oesophagus I have of course omitted all mention of congenital atresia, of the paralytic conditions that we meet with in lesions of the central nervous system, of the various forms of oesophagitis, of syphilis and tubercle, whilst the merest suggestion of a foreign body has been suppressed. But all these conditions must naturally be taken into account in attempting to arrive at a diagnosis.

DISCUSSION.

Dr. A. BROWN KELLY (Glasgow) said:

In cardiospasm one sometimes is in doubt as to whether the closure at the lower end of the oesophagus is due to spasm or to malignant disease in the stomach. *X* rays and the oesophagoscope assist in the differentiation. I shall deal only with the appearances in the hiatal region observed by means of the latter.

On introducing the oesophagoscope, usually a quantity of cloudy fluid and food débris is ejected, and more or less dilatation of the lower two-thirds of the gullet is noted. On approaching what is often termed the cardia, but is really the upper part of the hiatal or diaphragmatic oesophagus, this is seen in the normal subject to be constantly opening and closing with inspiration and expiration. Even when the tube is pushed down so as to encircle the gullet this rhythmical action continues until the lumen is enlarged by the pressure so as to allow the tube to pass into the stomach.

In cardiospasm precisely the same opening and closing of the hiatal oesophagus goes on as long as the tube is kept at least 3 cm. above the hiatal oesophagus, but when it is pushed down 1 or 2 cm. farther the wall of the hiatal oesophagus gathers itself together so that the mucous membrane forms a closed rosette. This closure becomes firmer when the tube is pressed down more strongly. If moderate pressure is maintained for about a minute, the closed oesophagus usually yields and the tube glides into the stomach. In old and severe cases more pressure is needed than in early mild ones. In several instances I have been unable to get into the stomach, and in one in which this difficulty and the pain in the epigastrium led me to suspect

malignant disease, gastrostomy was done, but the stomach proved healthy. These features all point to spasm as the cause of the obstruction and do not suggest achalasia.

Various objections have been raised to the view that the affection under consideration is due to spasm. The question is asked, Why does the constant spasm not produce hypertrophy of the sphincter? Sometimes it does. But the spasm is not constant; it is intermittent, as has just been stated, and apparently it is excited by pressure for the time being above the hiatus. In the more advanced cases when the gullet always contains fluid and food the constant pressure may, of course, excite constant spasm.

But turn for a moment to the upper end of the gullet, where constant spasm may be present for ten, twenty, or more years. I have never heard that hypertrophy occurred in these cases; the investigation of the condition of the muscles involved would, however, be interesting. In passing I should like to ask the members whether they have found two varieties of spasm at the upper end, one in which the closure is effected by the gathering together of folds of mucous membrane, and another in which the greatly reduced lumen is surrounded by a sharp edge of mucous membrane, the upper surface of which is smooth so that it looks like a thin web (? contracture).

Another objection to attributing to spasm the affection known as cardiospasm is that in such cases a weighted bougie passes through the cardia easily, whereas if spasm existed there would be resistance and withdrawal would be difficult (Hurst). The resistance has been compared to that offered by the anal sphincter in a state of spasm to the introduction of the finger. Spasm of a muscle, such as the external sphincter of the anus, is not comparable with that of the cardiac sphincter, which is composed of unstriped muscle fibres. Further, there are all degrees of cardiospasm, and, as I emphasized years ago, some of these are slight and little more than a state of non-relaxation. Still, even the mild degrees of cardiospasm offer more resistance to the endoscope than does the hiatal oesophagus in the normal subject.

The contraction of the hiatal oesophagus, when pressed upon by the oesophagoscope, is apparently not due to hyperaesthesia of the mucous membrane, as I at one time believed. For the end of the pump can be passed along the hiatal oesophagus, cold water can be squirted against it, and it can be painted with cocaine without the rhythmical opening and closing being affected.

These observations and considerations seem to me to prove the following: (1) That the obstruction at the lower end of the gullet in the affection commonly termed cardiospasm is due to spasm; (2) that this spasm is predisposed to by a state of irritability of the muscle fibres, or of the nervous mechanism controlling them, in the wall of the oesophagus above the hiatus; and (3) that all the endoscopic appearances are against the theory of achalasia.

Sir STCLAIR THOMSON pointed out the improvement in methods of diagnosis possessed by the present generation. Last century disease of the gullet had to await attention until it had produced a stricture. The latter could only be investigated by the blind use of a bougie. Now, with the *x*-ray examination and direct endoscopy matters were very different. He quoted two cases to show that the progress of malignant disease may be very slow and that spontaneous improvement and increase of weight may occur even in a case of epithelioma. He made an appeal for the routine examination of the oesophagus in all affections of the chest and abdomen, pointing out that he had made an analogous appeal in regard to the accessory sinuses of the nose many years ago. He also deplored that students had not the opportunity in this country, which they had in America, of acquiring the art of endoscopy by practising on live but anaesthetized dogs.

Mr. W. S. SYME (Glasgow) said that he certainly thought there was a definite condition of spasm of the lower part of the oesophagus. Moreover, this was not such a rare condition as was supposed, and in consequence he could not subscribe to the opinion that such a large proportion of cases of oesophageal obstruction as 90 or 95 per cent. were due to malignant disease. The spasm of the oesophagus was not always at the opening through the diaphragm. In one case which he was able to demonstrate the spasm occurred about an inch above that opening; it could not therefore be due to spasm of the crus of the diaphragm. In dealing with spasm of the upper opening of the oesophagus he did not think it mattered for practical purposes whether this arose first at the lower part of the pharynx or the upper part of the oesophagus. It would overflow from one to the other. The spasm might be set up by various conditions, and might vary in severity. In one case it was so severe that almost complete starvation was caused. It was cured by the amputation of an elongated uvula. Many cases of spasm of the upper part of the oesophagus were due to irritation by post-nasal discharge due to nasal accessory sinus disease or other cause. To return to what was called cardiospasm he thought it should be stated that there was not by any means always dilatation of the oesophagus above. Dr. Kelly inquired as to the presence of a web at the upper end of the oesophagus. He had seen such a case. The condition in which folds of the mucous membrane were found at this part was not uncommon. On passing the oesophagoscope the impression was obtained that this was the oedematous mucosa above malignant disease, which as the oesophagoscope passed onward was found to be absent.

The PRESIDENT said that he agreed with Dr. Syme and other speakers in saying that the selection of the subject of discussion had proved very fortunate. Some doubt had been thrown upon this, but the result of the papers read by Dr. Paterson and Mr. Howarth, with the remarks which had followed subsequently from the different speakers, showed that the subject was of great interest, that there was much to learn, and he ventured to think that the result of the discussion would be a great stimulus to further investigation of many points we did not fully understand because of the apparently simple action or function, the explanation of which was taken for granted.

For example, he thought that the question of reflex action causing great spasm of the oesophagus and often difficulties in diagnosing, as well as cardiac spasm, should be very carefully reinvestigated. One thing, the President said, was quite certain—that a search would have to be made farther afield for causes of spasm.

He mentioned the case of a patient who suffered from severe chronic obstruction in the oesophagus, who had been to a number of the hospitals in London, and the specialists in each hospital, many of them distinguished men, diagnosed organic stricture of the oesophagus. He fell latterly into the hands of Mr. Mayo Collier, who brought the case before the British Rhinological, Laryngological and Otological Association. The man came to his wards dying; a *post-mortem* examination was made, and the parts showed that the ulceration was not in the oesophagus at all, but at the cardiac end of the stomach. So here there were errors in diagnosis by a number of skilled experts, but it shed light upon severe spasmodic stricture of the oesophagus. Of course, the methods of examination were crude as compared with the direct examination by means of the oesophagoscope of to-day and the *x* rays.

The President said that in certain cases of this kind we had to go farther afield, and he mentioned the case of a young man who was greatly troubled with obstruction of the oesophagus and cardiac spasm, and where the *x* rays by means of the screen had thrown great light upon the case. The patient was in a darkened room on a table, with the tube below; the bismuth meal was administered and passed fairly easily into the stomach. Almost immediately the stomach assumed a vertical position, and it became pear-shaped, with a large dome pressing against the diaphragm. After a few minutes the heart began to flutter and violent movements were easily seen on the screen, and it was important to note that this disturbance of the heart action was seen before the patient said, "That is the fluttering of my heart coming on again."

The President said that before proceeding farther he would like to point out what the normal function was and what took place after food entered the stomach. The cardiac end of the stomach was closed by the action of the sphincter in the region of the lower part of the oesophagus and stomach. At the same time the pyloric end of the stomach was closed, and afterwards the movement of the viscus for digestion proceeded. After a time the stomach contracted and food was passed into the duodenum, going over in a mass. This action at both ends of the stomach took place again during the movements for digestion, and at the proper time the food again passed downwards into the bowel. It was a function of the oesophagus to prevent the food coming back into the mouth. In other words, the action of closing the cardiac end of the stomach and oesophagus was necessary to the passage of the food in the right direction, or regurgitation would take place.

They were apt to consider that the function of the œsophagus consisted in a simple opening of the tube to let the food into the stomach, a period of rest following, but that was not the case. The œsophagus in conjunction with the pyloric end of the stomach was constantly in action to keep up the proper tension and direct the food onwards.

The President assured Dr. Paterson and Mr. Howarth that the members of the Section of Laryngology had genuinely and thoroughly appreciated all their work and were very grateful to them.

PLASTIC OPERATIONS FOR NASAL DEFORMITY.

Dr. DOUGLAS GUTHRIE showed a series of photographs illustrating the results of plastic operations in fourteen cases of nasal deformity. In three cases the disfigurement was the result of syphilis, in two cases lupus was the cause, and the remaining nine cases were of traumatic origin. The photographs demonstrated the superiority of costal cartilage transplantation over the injection of paraffin, in the treatment of saddle or sunken nose. The majority of the cases had stood the test of time, the cartilage remaining unaltered in its new position.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

SOLUTION OF TRINITRIN IN ACUTE NEPHRITIS.

I DESIRE to call attention to the great value of liquor trinitrini in the treatment of acute tubular nephritis, accompanied with dropsy. It is said that there is nothing new under the sun, but I struck upon this remedy by pondering over the question: What prevents a speedy cure of our cases of acute nephritis? I have watched my cases for the last twenty-five years in Glasgow; and, in my experience, to remove the last trace of albumin from the urine of these patients is by no means easy. I think I can safely say that it is quite a common experience to treat the patients with iron tonics and diuretics for six to twelve months before we accomplish our purpose.

The last four cases cleared up so quickly—from a few weeks to a few months—that I venture to state how this was achieved. Three of the patients were up in years, but one was about 30. The urine contained a good deal of albumin. Two of the cases had orthopnœa, due to œdema of the bases of the lungs. One—an old hemiplegic—passed a good deal of blood. His pulse tension was so high that I predicted that he might have a fit, and he had a seizure that night. All the patients made a speedy recovery. Iron tonics were given as soon as the albumin left the urine. The diet was light, limited to fluids, either milk or soups. Purgatives were not employed. The following mixture was given:

℞	Pot. acetat.	ʒv
	Liq. trinitrini	ɱxxxij
	Tr. card. co.	ʒiv
	Aq.	℥viij

Half an ounce of this mixture, in water, was given every three hours until the symptoms abated, then thrice daily.

Glasgow. JOHN T. MACLACHLAN, M.D.

RUPTURE OF QUADRICEPS TREATED BY SUTURE.

THE following somewhat rare accident, and the treatment adopted, may be of interest. On June 6th Mrs. E., aged 62 years, slipped on going down some steps, and after making a violent effort to recover her balance fell down.

In bed at home, shortly afterwards, she stated that she could not lift her right leg, in which she suffered considerable pain. There was some swelling at and above the right knee-joint, and there appeared to be a gap in her quadriceps extensor muscle about an inch above the patella. She was unable to put this muscle in action. An *x*-ray screen showed no fracture of the patella. I decided to explore the tear in the quadriceps extensor, and under ether a large flap of skin was raised above the patella, and a complete division of the muscle was discovered, but, curiously, no blood clot or bleeding was found at the point of division. Mattress sutures of thirty-day catgut were used, and the wound healed by first intention. She has now complete use of her leg, can lift her heel off the bed with the knee extended, and the gap felt above the knee after the accident has entirely disappeared.

The only similar case I have ever seen during thirty years of practice was that of an old gentleman over 70 years of age; in his case no operation was performed, a back splint and strapping being applied; the muscle never united, and a gap remained permanently.

Kettering. LESLIE W. DRYLAND, L.R.C.P., M.R.C.S., D.P.H.

ABNORMAL ANTERIOR FONTANELLE.

ON making a vaginal examination in a case of labour lately I felt anteriorly what I took to be the posterior fontanelle. There was a depression and three sutures and nothing more. There was no caput succedaneum. Later, as I put on forceps, I was surprised to find the posterior fontanelle lying posteriorly. That this was so was proved by the long rotation of the head as I delivered very easily. After birth I discovered the reason of my mistake. The anterior fontanelle was represented by a dimple where the four sutures met. It was not as usually found and described: for example, in Shears's *Obstetrics* the anterior fontanelle is said to be distinguished in that it is large and soft, and in Berry Hart's *Guide to Midwifery* the anterior fontanelle "is known by its shape and size." There were of course four sutures, but the possibility of such a fontanelle was not known to me, so I had not searched for the fourth suture. There was no head moulding.

CHARLES J. HILL AITKEN, M.D.

Kilnhurst, near Rotherham.

THE TREATMENT OF PULMONARY TUBERCULOSIS BY TUBERCULIN.

OPINIONS as to the value of tuberculin in lung tuberculosis are so conflicting that the following figures may be of interest. They refer to the present condition of patients treated during the years 1910 to 1915. Only patients who had tubercle bacilli in the sputum are included; no "doubtful" cases are considered. They came under my care while holding the post of medical officer to the Oxfordshire Association for the Prevention of Tuberculosis, and were domiciled not only in the city of Oxford, but also in the surrounding country districts. Owing to the distances from the central dispensary at which the patients lived only a certain number could attend for treatment by tuberculin. Thus, with the exception of a few cases in which the patient's own doctor undertook the administration of tuberculin, it was possible, by virtue of geographical considerations, to have the advantage of a control series. The following table shows the results of treatment of 429 cases of pulmonary tuberculosis; of these, 346 were treated without tuberculin, and 83 with tuberculin.

	Treated without Tuberculin.		Treated with Tuberculin.	
	No.	Per Cent.	No.	Per Cent.
Dead	311	89.9	33	45.8
Alive	18	5.2	41	49.4
Lost sight of ...	17	4.9	4	4.8
Totals... ...	346	100.0	83	100.0

From the table it will be seen that of the 83 patients treated with tuberculin there are 41 (49.4 per cent.) now alive, as against 5.2 per cent. of the 346 patients who received "general medical treatment." Included among the 38 cases who were treated with tuberculin and who are now dead are 3 patients who died from causes other than tuberculosis—one from *post-partum* haemorrhage, and two during the influenza epidemic, having enjoyed up to their death a very reasonable amount of health. One of the 311 cases was killed in the war.

The enormous mortality among the "open" cases of tuberculosis of the lungs in the dispensary class of patient, after a period of years, will be observed, notwithstanding the advantages these patients had of living in the country. The method of tuberculin administration employed was on the lines of that recommended by Camac Wilkinson—namely, gradually increasing doses, twice weekly, of bovine tuberculin (P.T.O. and P.T.), commencing with 0.0005 c.cm. of P.T.O., and continuing up to 1 c.cm. of P.T., with, in some cases, a few injections, at the end, of Koch's old tuberculin (T.A.) until 1 c.cm. was given. The course of treatment consisted of about forty injections, lasting roughly six months, at a cost of less than a week's stay in an institution.

Oxford. WILLIAM STOBIE, M.D.

Reviews.

INJURIES OF THE PERIPHERAL SPINAL NERVES.

DURING the last few years numerous monographs have appeared dealing with the treatment of injuries of the peripheral nerves, and, although by this time most of the problems which confronted us in the early months of the war have been solved, each new publication appears to add some information to our knowledge of this fascinating subject. In the *Treatment of Injuries of the Peripheral Spinal Nerves*, by Sir HAROLD STILES and Dr. FORRESTER-BROWN,[1] we have the most complete and detailed account of the operative treatment, and almost two-thirds of the book is devoted to this aspect of the subject.

Part I contains a very concise and accurate account of the anatomy of the spinal nerves, and attention is carefully directed to most points of greatest significance for accurate diagnosis. The indications for operation and the choice of the type of operation are clearly set out, and these, together with the section on the factors which influence prognosis, are in agreement with the conclusions arrived at by most workers in this field. In their discussion on recovery the authors state that they have found Tinel's sign valuable, although its absence was no proof that recovery was not occurring. It is doubtful whether this statement will meet with general approval, since some workers have found Tinel's sign of very limited service and regard it as not infrequently misleading. The table showing the recovery after suture in sixty-nine patients would be more valuable had information been included as to the interval which had elapsed between the reception of the injury and the time of the suture, and had it been possible to follow the recovery after operation for fully two years in more than fourteen of the cases.

Part II is devoted to a most complete account of the operative treatment. The best exposure for each nerve at different levels, the surgical anatomy, and the fullest details of the methods which have furnished the best results are all admirably presented. This part represents a very valuable contribution to knowledge, and includes much original matter which is based upon a very extensive experience of the surgical treatment of peripheral nerve injuries.

Part III deals with the operation of tendon transplantation, and here again the fullest details are included and attention directed to all factors which may influence the functional result. To compensate for the loss of the intrinsic muscles of the hand an ingenious operation is described by which the insertion of one of the flexor tendons is sutured to the extensor communis tendon, just distal to the knuckle, so as to make it a flexor at the metacarpo-phalangeal and also an extensor of the interphalangeal joints.

The volume contains a good index, and is well and freely illustrated by diagrams, photographs, and coloured plates. We have read this monograph with much interest and pleasure. We commend it to surgeons, who, we believe, will be unanimous in agreeing that it is a very agreeable contribution to surgery.

CLINICAL STUDIES FROM LEYSIN.

THE new volume of the series published under the title *Études sur la Tuberculose*[2] consists of a collection of thirty-one papers by no fewer than eight workers at the well-known Swiss station of Leysin. Since the publication of the last volume six years have elapsed, during which the war made severe inroads on the time and occupation of those on the staff of the public sanatoriums, and it is a matter for congratulation that during such a period they have found it possible to accomplish so much original work; a considerable part of it has involved the careful observation of cases over stretches of several months. The book is divided into three sections. The first, dealing with clinical studies, is opened by Dr. Jaquerod, who considers the relation between erythema nodosum and tuberculosis. While holding that the skin lesion is of a tuberculous nature, he regards it as due to no more than a temporary bacillaemia occurring in a patient suffering from a latent focus. So far from being of grave prognostic significance, there would appear to be no more danger of the supervention of active tuberculosis than in the case of patients who have never suffered from the disease. In a later section Dr. Burnand explains the classical antagonism between mitral stenosis and the development of tuberculosis by showing that it is apparent rather than real. In fact, the opposite is the case: the two are frequently associated. The valvular lesion itself is, he holds, of tuberculous origin occurring in a subject having a small focus in the lung, which pursues a slow, benign, non-destructive course, and hence is generally overlooked in the clinical examination. However suggestive his clinical studies on this question may be, he would carry more conviction if he could bring to his aid the confirmation of pathological observations. The effect of the influenza epidemic of 1918 on the patients undergoing treatment is shown to have been comparatively slight, and there is little evidence to indicate that it was responsible for the activation of more than a small proportion of cases which developed tuberculosis in the subsequent few months.

The second part of the book is of particular interest, dealing, as it does, chiefly with the question of artificial pneumothorax. For the greater part of the work on this subject Dr. Burnand, the medical director of the sanatorium, is responsible. Regarding it mainly from the point of view of its curative effect, he brings forward his own statistics relating to 133 patients treated by this method during the course of the last nine years. The discrepancy existing between the immediate and the after results is striking. However excellent may be the effect on the lung during the two or three years of compression, the ultimate prognosis for the patient is by no means too bright. Only too common is it for those in whom the disease has been arrested for three, four, or five years to succumb eventually to tuberculosis. Not the least point of interest is the obvious disagreement noticeable between the views of Dr. Burnand and those of Dr. Jaquerod on the subject. The latter still regards the operation as of only occasional value, and is very emphatic in stating that a cure obtained by hygieno-dietetic measures alone, without the assistance of artificial therapy, stands a far greater chance of remaining permanent than one obtained by the help of new-fangled methods, however skilfully applied. He, however, recognizes the value of tuberculin, and, indeed, deals with it in a very luminous manner, the indications for its use being definite and precise.

Finally, in the last section various studies are presented, such as those dealing with blood pressure, Wildbolz's uro-intradermal reaction, and certain prophylactic aspects of the disease. To all those whose interest lies principally in clinical medicine this book will make a strong appeal.

THE AMERICAN GYNECOLOGICAL SOCIETY.

THE forty-fifth and forty-sixth volumes of the *Transactions of the American Gynecological Society*[3] contain much that is of great interest. The meetings of the society are reported more or less verbatim, and where space is not a matter of consideration this method adds a piquancy to the reading which is lacking in condensed reports. Moreover, they show that this society is no mere mutual admiration society, some of the criticisms being distinctly trenchant. One of the most interesting items in the volume is a report presented by Dr. G. W. Kosmak of a committee appointed to consider how best the society could advance gynaecology and obstetrics. It is full of suggestions which are of general applicability and will assuredly prove fruitful. The discussions reported cover a wide range of subjects, mostly obstetrical. Obstetric anaesthesia is discussed by Dr. E. P. Davis with particular reference to the more modern nitrous oxide-oxygen and ether-oxygen methods. Induction of labour is discussed by Dr. C. B. Reed, who advocates the use of Vorhees's bag, and Dr. B. P. Watson, who recommends repeated doses of pituitary extract 0.5 c.cm. at intervals of twenty to thirty minutes. The congress apparently felt apprehensive at the thought of employing such large doses of so potent a drug, but Dr. Watson said that he had had no bad results and a high percentage of success. Professor De Lee described his conduct of a confinement *de luxe* by the prophylactic use of forceps and episiotomy, followed by rapid expression of the placenta. This procedure was vigorously and almost unanimously condemned. Professor Whitridge

[1] *Treatment of Injuries of the Peripheral Spinal Nerves.* By Sir Harold J. Stiles, K.B.E., F.R.C.S.Edin., and M. F. Forrester-Brown, M.S., M.D.Lond. Oxford Medical Publications. London: Henry Frowde, and Hodder and Stoughton. 1922. (Roy. 8vo, pp. viii+180; 58 figures. 15s. net.)

[2] *Études sur la Tuberculose (5-ième Série).* Station Climatérique de Leysin. Par les Docteurs Burnand, Grosjean, Jaquerod, Piguet, De Reynier, Rossel, Sillig, et M. J.-V. Bergen, Docteur en Sciences. Paris: Masson et Cie. 1922. (Demy 8vo, pp. 518; illustrated. Fr. 15 net.)

[3] *Transactions of the American Gynecological Society.* Edited by G. G. Ward, Jr., M.D. Vols. 45 (1920) and 46 (1921). Philadelphia: W. J Dornan. (Med. 8vo, pp. lxxiv+482; illustrated.)

Williams contributed a valuable paper on the Wassermann reaction in obstetrics, in which he emphasized the value of active antisyphilitic treatment during pregnancy. Extraperitoneal Caesarean section, the operative treatment of sterility, artificial insemination, acidosis in operative surgery, the stages in the transition from benign to malignant conditions in the ovary, uterus and vulva (by Dr. T. W. Eden), the microscopic anatomy of the pregnant tube, the value of a "follow-up" system for obstetric hospitals, haemorrhage into the pelvis not due to tubal pregnancy, radium and cancer, lutein cysts and hydatidiform mole, the status of the intrauterine stem pessary, pregnancy and labour associated with cardiac disease, the teaching of obstetrics in a modern medical school, basal metabolism in pregnancy and the puerperium, pneumoperitoneum and roentgenology as aids to more accurate obstetric and gynaecological diagnosis (by Dr. Reuben Peterson), endocervicitis and eversion treated by the nasal cautery tip (Dr. R. L. Dickinson)—these are only some of the papers included in these volumes, but the enumeration will serve to show the catholicity of the society's interests. Gynaecologists on this side of the Atlantic will find much of interest in these volumes and not a little of real importance. The society is to be congratulated on its vitality and on the financial strength which, in these days of high prices, permits the publication of such handsome volumes.

PASTEUR AND HIS WORK.

M. L. DESCOUR in his book *Pasteur and his Work*[4] gives an account of Pasteur's researches extending from his early studies on crystallography to his crowning triumph in the production of immunity. His epoch-making contributions to the advance of science are, to quote the words of Dr. Émile Roux, "described with a precision, an orderliness, and an emotion worthy of so great a subject." The book deals almost entirely with Pasteur's work, but it contains many quotations from his writings and those of his critics, so that a living interest is imparted; especially is this true of the chapters on fermentation and spontaneous generation. Other books on Pasteur give a better insight into his character and habits, of which in this volume we only gain occasional glimpses, but none do better justice to his prodigious labours and the amazing success of his researches.

Pasteur was born nearly a hundred years ago (December 17th, 1822), and the centenary is to be celebrated next spring. He showed no particular promise in his youth, and in 1842 he became "bachelier ès sciences" with the least possible distinction, the future chemist receiving for his medical paper the comment "médiocre." Nevertheless, the thoroughness, originality, and conclusive results of his early researches on crystals made a great impression on the minds of his teachers. From the study of crystallography he turned to fermentation, and from this to the then much debated question of spontaneous generation. He always had in view the practical outcome of his laboratory labours, and M. Descour has clearly indicated how Pasteur's discovery of bacteria as the cause of fermentation led him on step by step first to the diseases of silkworms, and next to the study of the contagious diseases of man.

The medical profession was, on the whole, slow to appreciate the value of his work on bacteria as the cause of disease, but Pasteur knew how to defend his point of view and could retaliate with vigour when attacks were made on him. When engaged in the study of puerperal infections he was sitting one day in the lecture theatre of the Paris Maternity Hospital listening to a discourse from one of the physicians on the causes of epidemics in maternity hospitals: "What causes epidemics is nothing of the sort: it is the doctor and his assistants who carry microbes from a sick woman to a healthy one," he cried. Later in life he had received recognition and homage from all branches of the medical profession, and at his jubilee in 1892 Lister expressed the admiration of all the world when, addressing Pasteur in public, he said, "Truly there does not exist in the whole world an individual to whom medical science owes more than to you."

We recommend M. Descour's book in its English dress to the general reader, to medical practitioners, and to those bacteriologists who, coming to the study of the science after its foundations had been well and truly laid, are perhaps not sufficiently acquainted with the labours of their predecessors.

[4] *Pasteur and his Work*. By L. Descour. Translated from the French by A. F. and B. H. Wedd, M.D. Second edition. London: T. Fisher Unwin, Ltd. 1922. (Med. 8vo. pp. 256; 1 illustration. 15s. net.)

GOLF.

ABOUT three weeks ago at the end of one of the many atrocious rounds of golf for which I have been responsible I came to the conclusion that my case was incurable. On the advice of *Punch*, and believing "Ex America semper aliquid novi," I studied *What is the Matter with Your Golf Game?* by Joseph Collins, M.D., neurologist. No benefit resulted. The Editor of the BRITISH MEDICAL JOURNAL suggested that I should try the WETHEREDS' book.[5]

It was an unusual idea that two people of opposite sexes should combine to write a treatise on golf. Mr. H. N. Wethered, who writes a short prefatory note, tells us that the original idea was that his daughter Joyce should write some sort of treatise on golf for young players. To avoid narrowing the field his son Roger contributed the technical sides of iron and wooden club play, and chapters on Oxford and American golf. In some respects this subdivision has not improved the volume; there is a tendency to repetition, and the error is almost unavoidable in a co-operative arrangement of this description.

In an interesting and entertaining chapter on "Ladies' golf" Miss Wethered raises the question of the difficulty which women have in the art of overhand throwing. She believes that this manœuvre is closely related to the action of iron club play, with which, according to Miss Wethered, women have considerable difficulty. It is of interest to medical men to notice that Miss Wethered suggests that the difficulty may arise from the "absence" of some necessary muscles. Possibly this is the story of Adam's rib in another form, but Miss Wethered may be comforted to know that her sex is under no handicap in this connexion; "want of development" would be a more correct description.

While the volume is in many ways very charming, it is not a book which can be confidently recommended to beginners. Neither of the authors possesses the art of making description easy to follow, and the male member of the combine may even be accused of unnecessarily complicating what will always remain sufficiently difficult.

It is unusual for our instructors in the art of golf to recommend a wooden club because of the size and shape of its striking face. Roger Wethered advises for the beginner a club which he describes somewhat as follows: "A fine breadth of face which is shaped in the form of a bulge designed to counteract a tendency to slice or pull. The hitting surface is deep enough to satisfy the foozler, who is inclined with the ordinary club to strike the ball below its centre." The wisdom of inserting advice of this description is doubtful. No one appreciates better than Mr. Wethered that the rhythm and the movement of a wooden club stroke are too complicated to be materially affected by minor structural details of the club head.

The book will arouse the old controversy as to the parts which the wrists play in the beginning of the driver swing. Both authors are opposed to an early movement of the wrist; this is contrary to the teaching of many first-class professionals, and it is interesting to notice that the photographs which demonstrate Miss Wethered's drive would appear to indicate early turning of the wrists. The advice to late beginners to cultivate a short back swing is good. A great deal of bad language would be avoided if this precept were more often followed.

The reader will be disappointed to observe that in the chapter which deals with American golf, and alludes more especially to the American invasion at Hoylake, no mention is made of Mr. Hunter, the amateur champion of last year. No amateur has done more for the fighting spirit of British golf. Surely it is savouring of exaggeration to draw such a strong distinction between the styles of the British and American amateurs as is done by Mr. Wethered. He leaves one with the impression that he ascribes the excellence of American golf to certain peculiarities of the American technique, but it is to be hoped that his deductions in this respect are incorrect.

The book is written for amateurs, and therefore it makes much of the faults of the game. A greater clearness of description, combined with simplicity of language, would have increased the value of the book; it is, nevertheless, an interesting contribution to the literature of the game, as representing the views of two leading British amateurs.

J. F.

[5] *Golf from Two Sides*. By Roger and Joyce Wethered. London: Longmans, Green and Co. 1922. (Demy 8vo, pp. 197; illustrated 10s. 6d. net.)

NOTES ON BOOKS.

A System of Clinical Medicine,[6] compiled by the late Dr. T. D. SAVILL, maintains its popularity under the editorship of his widow, Dr. Agnes Savill; the sixth edition has just appeared. The special feature of this work is that the diseases are dealt with primarily from the point of view of the symptoms they present, the symptoms being afterwards traced to their causes. With the assistance of experts in various subjects the new edition has undergone a thorough revision, and a number of additions have been made. The chapter on diseases of the lungs has been revised by Dr. James Torrens, and those on immunity and clinical bacteriology by Dr. Skene Keith. Dr. Harry Campbell, who for a previous edition had rewritten the section on nervous diseases, has again brought it up to date. As has been said, the book in its construction has a character which will continue to appeal to many readers.

In the small book entitled the *Students' Guide to Vaccination*[7] Dr. AITCHISON ROBERTSON gives a clear and concise account of the whole process of vaccination. He gives advice as to the examination of the child, the instrument to be used, the preparation of the skin, the progress of the pock, and the abnormalities which may in rare instances occur. He briefly discusses also human and calf lymph and the glycerination of lymph, the duration of vaccinal protection, the need for revaccination, and the law in England, Scotland, and Ireland. But the little work is more than a mere guide to the practice of vaccination. About one-half of it is devoted to the subject of small-pox, its symptoms, varieties, diagnosis, prevalence, mortality, and prevention. The brief historical notes on the prevalence and fatality of small-pox in pre-vaccination times, the practice of inoculation introduced through the influence of Lady Mary Wortley Montagu, the discovery of vaccination by Jenner, and its marvellous effects on prevalence and mortality, ought to stimulate some of the readers of the book, after they have graduated, to follow up the subject as a special study in epidemiology and preventive medicine.

It might be expected that a notebook for students and a ready work of reference for the busy practitioner—this is Mr. T. W. WIDDOWSON's description of his *Notes on Dental Anatomy and Dental Histology*[8]—would contain a valuable array of facts helpful in daily practice. But this is not the case; the subjects dealt with are essentially examination subjects, and, as far as the student is concerned, he will find a large range of extremely interesting, but oftentimes very academic, subjects, briefly but thoughtfully noted. The varieties of teeth, enamel, and dentine found in birds, beasts, and fishes; the theories concerning the evolution of the cusps of the human molar; the structure of whalebone: these and a hundred similar subjects form the great bulk of the book, and one is left wondering, not why Mr. Widdowson has set them forth in compressed form, but what purpose they serve in an overcrowded curriculum. While the general execution of the work is good, there are a few errors and ambiguities which should be removed. What value has such a statement as, (enamel) "being an epithelial structure the same poison which is produced by the germ of scarlet fever, etc., causes the death of epithelial cells, of the skin, of the hair bulb, of the mucous membrane, and of the enamel organ," as an explanation of hypoplasia of enamel? What interglobular spaces are referred to on page 15? Is it a fact that syphilis, struma, and exanthemata accelerate eruption of the teeth? On page 34, under the heading "lamellae," we read, "they are more numerous in young than in completed cementum. As age advances the lamellae increase in number and the cementum in thickness"—apparently contradictory statements. Is the author perhaps thinking of pathological increase in later life? Why, on page 43, is a description of the glands draining the tooth-bearing areas thrust into a note on the question of the existence of lymphatic vessels in the tooth-pulp? We may ask, too, why such words as "Zahnleiste," "Lippenfurche," "anlage," need be used? The illustrations are clear and appropriate, but we wonder why, in the diagram showing the state of calcification of the teeth at various ages, the enamel is depicted as calcifying first at the tip of the finished tooth and not at the tip of the dentine papilla. At the "cram" stage students will find the book useful.

[6] *A System of Clinical Medicine, dealing with the Diagnosis, Prognosis, and Treatment of Disease: For Practitioners and Students.* By T. D. Savill, M.D.Lond. Sixth edition. London: E. Arnold, 1922. (Med. 8vo, xxviii+951; 172 figures, 4 plates. 28s. net.)

[7] *The Students' Guide to Vaccination.* By W. G. Aitchison Robertson, M.D., D.Sc., F.R.C.P.E. London: A. and C. Black, Ltd. 1922. (Cr. 8vo, pp. 88. 3s. 6d. net.)

[8] *Notes on Dental Anatomy and Dental Histology (Human and Comparative).* By T. W. Widdowson, L.D.S. Fourth edition. London: John Bale, Sons, and Danielsson, Ltd. 1922. (Fcap. 4to, pp. viii+238; 86 figures. 15s. net.)

From Switzerland to the Mediterranean on Foot[9] is the story of a tramp of an unusual kind, for it can have occurred to few people to walk from the Rhone Valley to the Riviera, and to fewer still to choose midwinter for the expedition. Dr. J. B. WINTER and his wife started from Sierre on December 3rd, 1919, and reached Cannes on February 5th, 1920; of the sixty-five days thirty-six were actually spent in walking. The total distance was 488 miles, and the average for each walking day was 13½ miles, so that it was not a hurried journey, and the travellers were afforded an opportunity of admiring the scenery, which in winter is, we can well believe, more imposing than in the summer. The travellers experienced no serious hardships, though many discomforts, and Mrs. Winter on one snow-covered pass suffered from frost-bite; on a few occasions they ran some risk. It is not everyone who would care to trust to telegraph poles as a guide down an unknown valley through fresh snow, and at one point a risk was taken on a frozen slope which was, perhaps, not justifiable. The route was down the Rhone Valley and along the southern shore of the Lake of Geneva to Thonon, then south to Annecy and Grenoble, thence south-west to Briançon, and then more or less south to Vence, Grasse, and Cannes. Dr. Winter has told an interesting story in a simple direct way. He has appended some notes on a few mountaineering expeditions in Switzerland.

The American Pediatric Society has published its thirty-third volume of *Transactions*, containing a report of the proceedings of its annual meeting held last year. It is edited by Dr. JOSEPH BRENNEMANN. The papers it contains, numbering forty-two, deal with a wide range of subjects; as is proper, many are concerned with the feeding of infants and children. A paper by Blackfan-Little of Cincinnati on the thymus in infants seems worthy of special mention; it is founded upon clinical and radiographic studies; it would appear that the application of *x* rays is of advantage when symptoms are believed to be due to persistent or enlarged thymus.

[9] *From Switzerland to the Mediterranean on Foot.* By J. B. Winter. London: T. Werner Laurie, Ltd. 1922. (Cr. 8vo, pp. 124; illustrated. 5s. 6d. net.)

MEDICINAL AND DIETETIC PREPARATIONS.

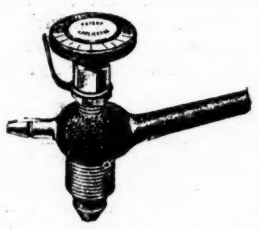
Chenopodium Oil.

CHENOPODIUM OIL has been adopted by the International Board of Health as a remedy for hookworm, and is recognized as having specific value in treatment for round worms; different varieties of the oil have been found to possess varying degrees of toxicity. Since the active constituent ascaridole is highly susceptible to decomposition there are good grounds for presuming that the toxic constituents consist of products of decomposition formed during distillation. We have received from Messrs. Burroughs Wellcome and Co. a specimen of chenopodium oil in gelatin capsules. They have been examined analytically with results showing that the oil contains not less than 90 per cent. of unaltered ascaridole. This high percentage is a trustworthy indication that the oil has suffered no appreciable decomposition in the preparation, and further that a concentration of the active constituent has been effected, for the average proportion of ascaridole in chenopodium oil is about 60 per cent. It is not certain whether ascaridole may not itself be toxic, particularly to idiosyncratic patients, but whatever the toxic effects of the substance itself as distinct from those of associated constituents, it will be a satisfaction to have an article in which the latter are greatly reduced in amount, which has a constant composition, is rich in the important therapeutic agent, and is appreciably free from products of decomposition.

MEDICAL AND SURGICAL APPLIANCES.

Fine Adjustment Valve for Oxygen.

DR. K. B. PINSON, Anaesthetist, Manchester Royal Infirmary, has designed the valve here illustrated to replace those at present in use. The action, which is quite different from existing makes, is, he states, easy and fine, and the closure absolute. The spindle is rustproof, the milled head is marked by divisions, and the nose contains a filter to prevent the entry of gritty particles from the cylinder itself. Dr. Pinson believes that the use of this valve will prevent much waste of oxygen and give a very delicate control where such is needed. The valve is made in several different types to fit all makes of cylinders. Cylinder valves of similar internal construction, for use with a foot key, are also made, the control of which, while quite satisfactory, is not so nice. The price of the former is 15s. and 16s. 6d., according to type, and of the latter 20s. The makers are the Condensed Gas Co., Ltd., 59-63, Grosvenor Street, All Saints, Manchester.



THE HEALTH AND HEALTH ADMINISTRATION OF ENGLAND.

(Continued from page 588.)

THE INSURANCE MEDICAL SERVICE.

CONTINUING our notice of Sir George Newman's report on the state of the public health (1921) we may take next the sections dealing with the insurance medical service. He is of opinion that the principal necessity is "a period of composure free from frequent modification and administrative change." Some changes, however, are inevitable, and some development in certain directions is generally desired. He observes that the insurance practitioner treats the patient, furnishes returns, demonstrates loss of time and work due to sickness, and contributes to knowledge of the causes of morbidity. It is desired also that he should co-operate with the medical officer of health, and advise and educate his patients in the manner of healthy living. In all these respects substantial service is being rendered.

Of the total 13,485,000 insured persons in England and Wales in 1921 there were on doctors' lists 12,506,000 and on approved institution lists 159,700, whilst 42,500 made their own arrangements for medical treatment. The insurance doctors numbered 12,079. In every area there is a fixed maximum, which can never exceed 3,000, and is often 2,000 to 2,500. About 34 per cent. of doctors have less than 600 on their lists, about 30 per cent. between 600 and 1,200, and only 14 per cent. (many of them with partners or assistants) have over 2,000. The chemists giving service are numbered 9,105, and the prescriptions dispensed about 29,250,000; the estimated cost of drugs £1,283,000.

Medical Records.

The keeping of records was resumed at the beginning of 1921, new forms being adopted. They are necessary in relation to an expenditure of £8,000,000 a year, and are said to be of value in the future interest of the patient. Collectively they may have statistical value in regard to disease incidence. About 9,000 visits were paid to doctors by the Ministry's medical staff for inspection of records, and it is recognized that an honest endeavour is being made to keep them properly. They are proving of great value.

Regional Medical Staff.

There are thirty-one regional and five divisional officers, who act as referees regarding incapacity for work, and discharge other duties. More than a year's experience of their work is said to prove that their appointment was amply justified; they have gained the general confidence of all concerned.

Certification of Incapacity for Work.

The statistics of referees' experience as to incapacity for work must be of particular interest to insurance practitioners. The total number remitted to the regional medical officers in 1921 was 69,543, of whom 1,543 were referred by practitioners, 153 by Insurance Committees, and the rest, amounting to 97.6 per cent. of the whole, by approved societies. The reason presumably was that they were doubtful of the medical attendant's certificate that the member was unfit for work. The results are striking. Including cases carried over from 1920, and omitting cases not completed at the end of 1921, we find from Sir George Newman's figures that 68,277 cases are in question. Of these 26,935 were found incapable of work, and 14,562 were not incapable; 26,780 "either voluntarily declared off the funds or for some other reason failed to present themselves for examination." Reducing the figures to rates, it thus appears that of 1,000 referred insured persons who had been receiving certificates of incapacity for work, and presumably obtaining sickness or disablement benefit from the funds of approved societies, only 392 were really found incapable, whilst 213 were found not incapable, and 395 went back to work of their own accord, or at least did not venture to submit themselves to the ordeal of the medical referee.

Disciplinary Cases.

Reports submitted to the Ministry by Medical Service Subcommittees in accordance with the Terms of Service numbered 339; of these 129 related to alleged failure to give adequate treatment, 83 to complaints of improperly charging fees, and 92 to medical certificates. In 48 cases deduction was made from Exchequer grants, and took effect against the practitioner's remuneration. Against decisions of Insurance Committees there were 16 appeals, 11 of them by doctors and 5 by insured persons or societies; 6 of the 11 were allowed, 4 dismissed, and 1 withdrawn. In 10 cases doctors appealed against the withholding by Insurance Committees of part of their remuneration on the ground of extravagant prescribing; 2 appeals were dismissed, 1 was allowed, in 3 the amounts withheld were reduced, 1 appeal was withdrawn, and 3 were still undecided. Eleven representations were made to the Minister for removal of names from the medical list: three were based on convictions in courts, and the rest related to allegations of neglect of patients or failure to give proper service; two names were removed from the list, one was allowed to resign on condition of not reapplying without consent, one was continued for twelve months, one died before inquiry, three were withdrawn, and three did not disclose any grounds for reference to a tribunal.

INFECTIOUS DISEASES INTRODUCED FROM ABROAD.

The weekly reports supplied by the Ministry to port medical officers are proving of material assistance.

Plague has been absent from this country, and India has been exceptionally free from it, though Northern China had a severe epidemic, which spread to Vladivostock. There were few cases on the continent of Europe, but the disease was discovered in several parts of Australia in September, 1921. Experience continues to confirm the importance of rats and rat-fleas as carriers of infection.

A serious epidemic of *cholera* prevalent in the famine-stricken areas of Russia in June and July underwent an abrupt decline in August; there has been no prevalence in the rest of Europe, though in parts of Russia and in the Ukraine it seems to have again become epidemic.

Malaria of exotic origin was notified in 1,644 instances in the year ending February 25th, 1922, against 4,168 in the previous year, and nearly 16,000 in 1919. Only 12 indigenous cases were discovered, against 103 and 36 in 1919 and 1920. It was found, however, that the malaria mosquito could accommodate itself to a dry year in South-Eastern England by resorting to exceptional breeding places, such as the river Wey at Guildford and deep pools in abandoned quarry pits in Kent. The other English anopheles showed a similar adaptability, so that the problem of control requires further biological study.

Typhus fever in 1921 was almost world-wide in distribution, largely owing to repatriation and refugees. Though there had been much diminution from the estimate of 20,000,000 cases in Russia in 1919-20, yet recrudescence occurred in November, both in Russia and Poland. The disease, however, was absent from England.

Dysentery.—The number of cases of dysentery reported was 1,228, against 1,353 in 1920 and 1,657 in 1919. Most of the cases were due to relapsing amoebic dysentery among ex-service men in July, August, and September.

Trench fever was notified only among discharged soldiers, and only to the number of 13 cases, against 39 in 1920 and 99 in 1919.

VENEREAL DISEASE.

Sir George Newman records that schemes of treatment on the lines laid down by the Royal Commission of 1916 have now been instituted in 61 counties, 80 county boroughs, and the City of London, making 142 in all. The treatment centres established number 194 (151 in voluntary hospitals, 15 elsewhere, and 28 in special premises), with about 800 weekly sessions. In 120 clinics there is provision for immediate treatment of gonorrhoea. The medical staff of the clinics consists of 384 approved officers. At most of the hospital clinics some beds are available for in-patients. There are 15 hostels for receiving 259 women and girl patients, and the number treated was 770. Nine institutions take in pregnant women with venereal disease, and valuable preventive results have been achieved as to ophthalmia neonatorum and infantile syphilis. The work of 1921 consisted mainly of consolidation by improvement of methods, increase of facilities, bettering of arrangements and equipment, and changes of personnel. The difficulty in getting patients to attend long enough is mentioned, and it is said in this respect much depends on the personality and efficiency of the medical director, and on the adequacy of the premises, especially for irrigation in gonorrhoea; special premises attached to hospitals are best. Most practitioners, it is stated, fail to take advantage of the facilities provided for examination of pathological specimens, and fewer qualify themselves for obtaining free supply of salvarsan substitutes, or attend with patients for consultation. There is lack of collaboration between medical officers of health and the venereal diseases officer.

The statistics show a significant reduction in the new cases dealt with in 1921 (roughly of about 20 per cent.). In 1920 the new cases numbered 105,185, and 84,715 in 1921; on the other hand, persistence in treatment is greater. It is claimed that the clinics are proving centres of enlightenment and education, and that the majority of cases of syphilis are

rendered temporarily non-infectious; it is believed by experienced officers that the reduction in new cases is due to this cause, and that a substantial proportion of syphilitic cases are cured even according to the rigorous standard of the Ministry. Sir George Newman concludes this part of the report by a statement of his views on the still more important subject of the prevention of venereal disease, which ought not to be separated from the treatment.

MEDICAL AND SANITARY ADMINISTRATION.

The survey of port and riparian districts was continued, and conferences with local authorities were held. Medical examination of aliens continues to work smoothly. Schemes as to isolation and small-pox hospitals were a subject of inquiry, and 140 inspections were made. The Public Health (Officers) Act, 1921, gives increased security of tenure to certain whole-time medical officers of health and sanitary inspectors. A qualification is now for the first time required for sanitary inspectors outside London, and, subject to exceptions allowed by the Minister, all medical officers of Health must now hold a diploma in public health or have three years' experience of the duties of the office. In Scotland, it may be remarked, every medical officer of health, whether his area be large or small, appointed under the Public Health Act of 1897 has been required for the last quarter of a century to hold a diploma in public health.

Poor Law Medical Service.—Systematic inspection is now made, at reasonable intervals, of all institutions. This, it may be remarked, is a great advance on the position when the Royal Commission on the Poor Law issued its report; at that time medical inspection was very much subordinate to lay inspection, both in amount and in authority. The treatment of the sick and the care of children under the Poor Law is receiving special attention, as are also the facilities for medical education at Poor Law institutions in the neighbourhood of medical schools. Need for improving the nursing service is noted, and for combining areas or pooling existing institutions so as to allow better classification of patients and the provision of special treatment. That also is an old recommendation.

Smoke.

Lord Newton's Committee recommended in 1921 that the Minister of Health should be empowered to act in the place of a recalcitrant local authority and to fix standards, contravention of which would raise a presumption that an offence had been committed. The Committee recommended that no housing scheme should be approved unless it contained specific provision for smokeless methods, such as were indicated in the Committee's interim report. In the book *The Smokeless City*, reviewed recently in this JOURNAL, mention was made of Lord Newton's regret that the opportunity for introduction of smokeless heating had not been taken advantage of by the Ministry, notwithstanding the Committee's recommendation.

Water Supply Shortage.—The drought of 1921 resulted in contaminated water causing a great outbreak of dysentery in the Ogmore Valley in Wales, where 700 cases occurred, none of them, fortunately, fatal. Scavenging defects, especially the dumping of city refuse in rural areas, received attention, and gratification is expressed that local authorities tend to substitute direct administration for contract work in dealing with refuse. Rat extermination at great refuse tips is impossible.

MEDICAL INTELLIGENCE, INVESTIGATION, AND RESEARCH.

The number of consuls and other British representatives abroad who gave information as to infectious diseases increased from 170 to 182, and nearly 5,000 dispatches were received. Information is also obtained through the international office and foreign governments.

Investigation and Research.

American types of pneumococci in this country are under observation in the Ministry's laboratories, also the influenza bacillus. Dr. Scott is endeavouring to ascertain whether any relation exists between the virulence of outbreaks of diphtheria and the type of bacillus concerned. At the vaccine lymph laboratories the results of differences in technique and new methods of preparation and storage were studied.

Auxiliary Scientific Investigation Fund.—The causes of stillbirth, encephalitis lethargica, the Schick reaction, rheumatism, and the pneumococcus were dealt with. Liaison is maintained with the Medical Research Council in respect of tuberculosis and other matters.

Statistical investigations included the charting by areas of the notifications of infectious disease, the issue of notes to districts as to undue prevalence of disease, and the summarizing of foreign statistical records. Other questions included the estimation of the prevalence of venereal disease, district mortalities of cancer, the economic effect of abolition of particular diseases, and the factors of infant mortality.

Epidemiological inquiries included one as to encephalitis lethargica, and a comprehensive report will be published shortly. The Departmental Committee on Rheumatism instituted field inquiries by the regional medical officers and insurance practitioners in various parts of the country.

International Work.

The scope of this work has already been incidentally referred to. Requests for advice on public health subjects from foreign, colonial, and home offices and the British Dominions have been complied with. For the Foreign Office Sir George Buchanan represents the Ministry on the Interdepartmental Committee on Quarantine. In September, 1921, the League of Nations established a Health Committee with a medical director and a small staff. It has made progress in the standardization of therapeutic serums and the serological tests for syphilis. It has also arranged for epidemiological inquiry in the near East, and the League's medical section organized a conference last March in Warsaw regarding epidemics of cholera, typhus, relapsing fever, small-pox, etc., in Russia and Eastern Europe. The League appointed an epidemic commission in 1920 to help Poland and other States on the western border of Russia to combat epidemics; Britain's contribution to the cost was £50,000. The funds were exhausted at the end of 1921; an influx of refugees from Russia to Poland was followed by a spread of typhus and relapsing fever. As Sir George Newman says, in concluding his report, there are two questions—What can be done internationally to help the States west of Russia? and, What can be done to deal with the present appalling health conditions in Russia itself?

ROYAL MEDICAL BENEVOLENT FUND.

AT the meeting of the Committee held on August 8th, 1922, 37 cases were considered and £477 voted to 35 applicants. The following is a summary of some of the cases relieved:

Daughter, aged 56, of M.R.C.S. and L.R.C.P. who died in 1918. Applicant has earned her living as a companion, but owing to ill health has had to give up her occupation. She is now in the Nightingale Hospital. Her only income is from the Health Insurance. Voted £18 in twelve instalments.

Daughter, aged 58, of L.S.A. and F.R.C.S. who died in 1913. Applicant was formerly a governess, but gave this up in order to look after her mother and attend to the home. Her father left her £200 and she has been living upon this, but it is nearly spent. Rent 3s. a week. Voted £18 in twelve instalments.

Widow, aged 53, of M.R.C.S.Eng. who died in 1920. Applicant has been supported by her eldest son, who has just died quite suddenly. She has had to borrow £15 for funeral and other expenses connected with his death. Her only income is £70 from the Widows' and Orphans' Fund and 10s. a week allowed by her son who is a clerk. The daughter is only able to support herself. Voted £15.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters J. Symonds, K.B.E., C.B., M.S., at 11, Chandos Street, Cavendish Square, London, W.1.

THE State Hospitals Commission, which controls all the mental hospitals in New York State, has issued its thirty-second annual report. The number of patients under treatment during the year was 49,376 (an increase of 832). The recovery rate based on first admissions was 25 per cent.; on the same basis those benefited formed 55 per cent.; 3,830 died. The total cost of upkeep was 15 million dollars; over three-quarters of a million was received from paying patients. The average payment of the paying patient was about one-half the average cost of maintenance. Each institution is visited twice yearly by the Commissioners and four times by the medical inspector. Quarterly conferences are provided for by law between Commissioners and superintendents and managers; at these clinical papers are read by members of the staffs. The medical staffs number 169, an increase of 27, but there are 44 vacancies. Excluding superintendent and interns, the ratio of physicians to patients is 1 to 277. The number of alcoholic first admissions decreased from 594 in 1917 to 122 in 1920, and the rate from 6 per 100,000 of general population to 1.2. There has been some diminution in the entry of combined cases of general paralysis and cerebral syphilis, from 962 in 1918 to 874 in 1920, "probably the direct result of the campaign against venereal disease which has been waged by the Federal and State Health Departments during the past two years."

British Medical Journal.

SATURDAY, SEPTEMBER 9TH, 1922.

THE DIAGNOSIS AND TREATMENT OF SEPTIC SINUS THROMBOSIS.

THE discussion on septic sinus thrombosis in the Section of Otology at the Annual Meeting of the British Medical Association in Glasgow is reported in full in our present issue; it should be read carefully not only by those who devote themselves to the special study of diseases of the ear, but by the medical profession at large. Septic sinus thrombosis is, in the vast majority of cases, a disease of neglect, and the condition is very much more common among the poor than among the more fortunate classes. The incidence of this, as of all intracranial complications, will be greatly lessened as the true importance of aural suppuration becomes more widely recognized and its adequate treatment is more generally adopted.

In his Presidential Address on brain surgery (JOURNAL, July 29th, 1922, p. 155) Sir William Macewen reviewed the modern history of the surgical treatment of intracranial diseases, our knowledge of which—like that of all other diseases—has been gained by clinical observation, *post-mortem* investigation, and experimental research. Brain abscess and meningitis were known to the Greeks and Romans and to the mediaeval surgeons; and Morgagni, early in the eighteenth century, showed clearly that intracranial suppuration was secondary to aural suppuration. Before the era of Lister occasional attempts had been made to cure intracranial suppuration by following up the track of a fistula, but the work of the modern brain surgeon, made possible by Pasteur and Lister, had to follow that of the research worker on brain function. So Macewen in 1881 followed Ferrier in 1873.

The complication of sinus suppuration was not recognized until the early years of the nineteenth century, long after brain abscess was known to arise from aural suppuration. Robert Hooper, in his *Morbid Anatomy of the Human Brain* (London, 1826), gives an illustration of suppuration in the lateral sinus, and says, in the description which accompanies the plate, that the condition had probably never before been observed. John Abercrombie, however, in *Pathological and Practical Observations on Diseases of the Brain and Spinal Cord* (Edinburgh, 1828, p. 45), gives in some detail the history of a patient suffering from this condition which he had recorded in August, 1816. Wilde and Toynbee—pioneers of aural surgery—observed cases of sinus suppuration, but without distinguishing them from other intracranial complications, and the first account of the condition in a work on general medicine was given by Lebert in 1859 (*Traité d'Anatomie Pathologique*).

Zaufal, at a medical meeting in Prague in 1880, recommended that in cases of sinus infection the internal jugular vein should be tied and the sinus opened, but his suggestion was not taken up except as a point for merely academic discussion. It remained for Arbuthnot Lane in 1888 to put this idea into practice; he had at the time no knowledge of Zaufal's recommendation. He was followed by Charles Ballance, who likewise was not aware of the earlier work of Zaufal or Lane. The operation soon became generally adopted.

During the discussion at Glasgow Sir William Milligan and Mr. Lionel Colledge touched upon some important points in the diagnosis of septic sinus thrombosis. The diagnosis in a typical case is not difficult: in any case of purulent otitis media a sudden rise of temperature, accompanied by a rigor, should always suggest the beginning of a septic sinus phlebitis. But atypical cases are not infrequent, particularly among children, and merely to await in such cases the development of the typical signs and symptoms would be disastrous. Often the aural discharge may have ceased for some considerable time, and the condition may be diagnosed as typhoid fever, pneumonia (especially a central pneumonia), pyaemia of unknown origin, or malaria. Various diagnostic tests can be employed to eliminate certain of these diseases; examination of the retina may show optic neuritis (which is present in about 30 per cent. of cases of sinus thrombosis), and a careful examination of the ear may reveal unsuspected pus and small granulations. There was general agreement in the discussion that in doubtful ear cases where there is any suspicion of sinus thrombosis it is better to operate and expose the sinus than to wait. Sir Charles Ballance well said on a former occasion in this JOURNAL (September 10th, 1921, p. 399) that persistence of disease in the temporal bone is the indication for operation; the indication for operation is not, and ought never to be, the onset of an intracranial complication. We do not await the onset of general peritonitis before removing an inflamed gall bladder, a suppurating Fallopian tube, or a diseased appendix.

In regard to the operative treatment of septic sinus thrombosis, the discussion in the Section of Otology ranged mainly around the subject of tying the jugular vein. There is a certain school of opinion—chiefly on the Continent—that ligation of the jugular vein is to be condemned unless the clot has actually reached the neck. On the other hand, certain surgeons tie the vein in all cases as a precautionary measure. The consensus of opinion at Glasgow was that the best practice lies somewhere between the two extremes. By ligating the vein the main channel of systemic infection is shut off, and free drainage is also provided for any septic material in the sigmoid sinus and the jugular bulb or vein. This procedure should be adopted when the jugular vein is obviously infected or when infection of the jugular bulb has been diagnosed; and when, after operation, it is found to be impossible to clear out the whole of the infected clot, or, the sinus having been cleared, the symptoms of infection continue.

OSTEOPATHY AND CHIROPRACTIC.

THE members of the medical profession in Britain and in the United States, while they have many points in common, have at the same time different problems and different difficulties confronting them. The fight against "medical clubs," which went on for so many years in this country until it subsided into the comparative placidity of National Insurance practice, has had no counterpart in America. On the other hand, the campaign against cheap medical schools and inferior medical qualifications, in which—almost entirely through the efforts of the American Medical Association—complete victory has now, we may hope, been gained, has been unnecessary in the British Empire. One of the most urgent problems to-day in the United States is the growth of medical "cults," with the assistance of newspaper and other propaganda, and certain of those "cults" have obtained so firm a footing, even upon the medical boards of certain States, that it appears to be almost impossible to dislodge them.

From time to time exponents of American "paramedical" theories have made guerrilla warfare upon this country, and one of these sporadic raids, aided by the ever-present publicity agents and advertising experts, appears to be in progress at the present time. Some months ago a well-attended (and well-reported) meeting

was held in London where among others a gentleman (reputed to be the funniest comedian in London) made a speech explaining how osteopathy had practically saved his life. It may be useful, therefore, for British medical practitioners to have some knowledge of what the brave words "osteopathy" and "chiropractic" really mean. They will find material for this in the *Boston Medical and Surgical Journal* of March 2nd, 1922, which contained the report of a committee of the Massachusetts Medical Society, who investigated these subjects fully.

Osteopathy was founded, it is said, by a doctor of medicine, and rests upon the assumptions that the human body contains all the elements necessary for health, and that if the circulation within the body is normal these elements will maintain health. The impairment of circulation, preventing the proper supply of these elements to all parts, is considered to be the cause of disease; this impairment is attributed to the action of the vasomotor nerves, which are assumed to be affected by direct pressure from bones, muscles, or ligaments in the region of the spine, or by reflex irritation from disturbance in visceral organs or other parts of the body. The founder of the cult stated that there was no need for the vast amount of medical knowledge which had been accumulated for centuries, because it was only necessary to discover the "lesion" that was causing the disturbance in the circulation, and to correct this, when health would result. It is hardly necessary to point out that there is, of course, absolutely no experimental or other scientific evidence in support of this notion—although a so-called "research institute" in osteopathy has been established in California. It appears that some of the more educated osteopaths are now condescending enough to allow that their "theory" need not replace all medical knowledge, and in very recent osteopathic writings some use is made of general medical knowledge, especially in regard to diagnosis.

Osteopaths vary somewhat in their conception of the so-called "osteopathic lesion"; but in general they agree that the lesion consists in certain abnormalities of the muscles, ligaments, or joints, and claim that in the presence of this combination of abnormalities the "lesion" should be found at some point along the spine in practically all diseases, although there is no specificity of the lesion for different diseases in the same organ. According to this crude doctrine tumour of the kidney, nephritis, tuberculosis of the kidney, and pyelonephritis would present a similar "lesion." The osteopathic method of treatment is to endeavour by manipulations "to correct displacement of the bony surfaces, if any exist, and to relax the muscular spasm and remove the point of tenderness." It is possible, even probable, that in a certain limited number of vaguely defined conditions —chiefly in those painful backs which every medical practitioner in industrial practice knows so well and which were so common on early sick parade in the army—the osteopathic "treatment" may afford a certain relief, just as simple rubbing would; but beyond that it has not been proved to be of any value whatever in diseases of known pathology, while it is also evident that it can do serious harm in various conditions, especially when applied without a general medical knowledge.

Chiropractic, which after osteopathy appears to be the most popular of the medical cults, likewise depends upon a "theory," and this theory consists in the claim that all diseases result from pressure upon nerves as they emerge from the spinal canal. One of the leading chiropractors says in his writings that he does not want a diagnosis, the idea being that if pressure is relieved from the nerve roots health will result, irrespective of the type of disease. This notion can obviously have no experimental or other evidence to support it, either in the published chiropractic writings or elsewhere. The committee of investigation goes farther than this, for it places on record that it is not convinced that the leaders in chiropractic are sincere, and it feels that the whole movement may be a gigantic fraud which has carried off their feet a certain number of sincere individuals. The procedure of the chiropractor is to examine the spine by palpation—and even by *x* rays—in order to locate "subluxation or malposition" of the vertebrae, and to profess to trace the course of the nerves for tender spots; the treatment consists in an attempt to reduce by manipulation the alleged malposition of the vertebrae. There is no evidence that this form of treatment is of any value whatever in any kind of disorder or disease. That the patient appears to receive a certain measure of comfort from the "treatment" appears probable from the tremendous growth of the cult throughout the United States, but any comfort that results must certainly be the effect of suggestion reinforced by a form of massage.

The committee of the Massachusetts Medical Society conducted its investigations in a particularly open-minded and unbiased manner. It may appear, however, to observers at a greater distance, that osteopathy and chiropractic are little more than terminological adaptations of bone-setting, with the site of operation cleverly transferred from the knee or the ankle, where results (if any) can at least be seen, to the backbone, where they cannot.

THE CONTROL OF GLYCOSURIA BY THE ISLETS OF LANGERHANS.

ON July 22nd (p. 140) we gave under this heading a preliminary account of important experiments into the etiology and treatment of glycosuria which had been carried on in the Physiological Department of the University of Toronto, under the direction of Professor J. J. R. Macleod, who had long been interested in diabetes and had made many investigations with regard to it. Early observations had shown that injections of extract of the whole pancreas were of no therapeutic value in the prevention of glycosuria, and Professor Macleod was driven to the conclusion that in all probability the islets of Langerhans were essential to the control of carbohydrate metabolism. Taking advantage of the fact that ligation of the pancreatic duct produced degeneration of the acinous cells but not of the insular cells, he, with the assistance of Dr. F. G. Banting and Mr. C. H. Best, arrived at the conclusion stated in our previous note. They found that when an extract of the gland, in which the acinous cells had degenerated while the islets of Langerhans remained intact, was injected, intravenously or subcutaneously, into dogs artificially rendered glycosuric marked reduction of the percentage of sugar in the blood and the amount of sugar excreted in the urine occurred. In later experiments it was found that the pancreas of foetal calves of under five months' development did not contain proteolytic enzymes, and by extracting such foetal pancreatic tissue a highly potent preparation was obtained; the evidence supported the conclusion that the active principle was essentially the same from whatever animal it was prepared. The comment was made in our previous note that if the experimental observations proved clinically applicable to man they might provide a very important means of treating diabetes. More recently there has been published[1] a joint paper by F. G. Banting and C. H. Best from Dr. Macleod's laboratory, by J. B. Collip from the Department of Pathological Chemistry, and by W. R. Campbell and A. A. Fletcher of the Department of Medicine of the University of Toronto, relating to results obtained in the treatment of diabetes mellitus. Collip succeeded in preparing an active extract, which retained its potency for at least one month, from normal adult ox pancreas, and this had been used by Campbell and Fletcher down to the time of the publication of the report in the treatment of seven cases of diabetes mellitus in the Toronto General Hospital. A fall in blood sugar took place in all cases, and in two,

[1] *The Canadian Medical Association Journal*, vol. xii, No. 3, p. 141.

repeatedly examined, there was a rise in the respiratory quotient, indicating carbohydrate utilization; it occurred more or less coincidently with the attainment of a normal blood-sugar level. Decrease in the amount of sugar excreted was observed in all, and it disappeared entirely if the dose was adequate. Ketonuria also was abolished. The patients reported complete relief from the subjective symptoms of the disease and clinically an improvement was shown in the better appearance of the skin and eyes and in the increased mental and physical activity of the patients. Only one case is reported at length—that of a boy, aged 14, who had suffered from symptoms of glycosuria for a little over two years. The amount of sugar excreted in the urine diminished rapidly after the injections were begun, but rose again when the injections were withheld. When they were resumed the sugar in the urine diminished again, though not to the same extent, but the doses given were smaller. The general conclusions of the authors are that by this treatment blood sugar can be reduced—in some cases even to the normal proportion; that sugar and acetone bodies can be made to disappear from the urine; and that the respiratory quotient affords evidence of increased utilization of carbohydrates. At the same time there is a definite improvement in the general condition of the patients.

FATAL CASES OF FOOD POISONING AT LOCH MAREE.

THE Scottish Board of Health has received a preliminary report from Dr. F. Dittmar and Dr. Gerald Leighton, two of its medical officers, who investigated the recent cases of food poisoning at Loch Maree, and has issued a statement which has been published in full in many newspapers. The Board accepts the diagnosis of botulism, and states that the symptoms commonly produced in the condition recurred in the cases at Loch Maree with painful uniformity—dizziness, headache, and perhaps nausea and sickness, double vision, ptosis, dilatation and sluggish action of the pupils, paralysis of the bowel producing constipation, paralysis of the lips causing difficulty of speech, of the muscles of the throat causing difficulty in swallowing, and of the muscles of the larynx causing loss of voice. The tongue also was paralysed. Respiration was affected, so that dyspnoea occurred; ultimately paralysis of respiration and the heart produced death. The temperature remained normal or subnormal. The Board praises highly the care and consideration shown by the local medical practitioner, Dr. Knox, and by Professor Monro and Dr. Carnegie Dickson, who happened to be staying at Loch Maree. The Board states that this is the first recorded outbreak of botulism in Great Britain and accepts the view that the symptoms were due to a toxin produced in the food before it was eaten. The *Bacillus botulinus* is an anaerobic organism, and could therefore grow in a sealed tin of preserved food, the taste and aspect of which would not be altered. The shortest interval between the ingestion of the food and the onset of symptoms in the Loch Maree cases was from sixteen to eighteen hours; the longest, we gather, was forty hours. Over a year ago the Ministry of Health and the Medical Research Council combined to make arrangements for the fuller investigation of the conditions which give rise to illness produced by the various forms of bacterial food poisoning. It was arranged that the investigation should be conducted in laboratories in the University of Bristol. The research there is directed by Dr. A. W. J. MacFadden of the Ministry of Health, in co-operation with Dr. W. G. Savage, medical officer of health for Somerset, and the work is carried out, under Dr. Savage's supervision, by Mr. P. Bruce White, B.Sc., who, according to the last report of the Medical Research Council, gives his whole time to it. Sir George Newman, Chief Medical Officer of the Ministry of Health, issued about a year ago a memorandum (C.L.1) to medical officers of health, describing the nature of the arrangements and including a memorandum by Dr. W. G. Savage with regard to the collection and transmission of samples. The Scottish Board of Health last year came into the scheme and the specimens from the Loch Maree cases were accordingly sent to Bristol. The pathological and bacteriological investigations are being conducted there, and their results, it may be hoped, will throw light on a form of food poisoning with regard to which there is still much to be learnt. The public inquiry opened at Dingwall on Tuesday.

THE BRITISH ASSOCIATION AT HULL.

THE ninetieth annual meeting of the British Association for the Advancement of Science is being held this week and next at Hull under the presidency of Professor Sir C. S. Sherrington, G.B.E., M.D., President of the Royal Society. The President's inaugural address on "Some aspects of animal mechanism" was delivered on the evening of Wednesday, September 6th, and an account of it appears elsewhere (p. 485). The Sections, of which there are again thirteen this year, began their work on Thursday morning. In the Section of Anthropology Mr. H. J. E. Peak gave his presidential address on "The study of man." In the Section of Physiology the first day's programme included a paper by Dr. T. Ritchie Rodger on "The effect of loud noises on the cochlea," indicating the results of his investigations into the deafness of boilermakers, and giving a comparison of these with the findings of other observers who have experimented with animals exposed to loud sounds. Dr. Rodger's contention is that the changes, indicated clinically and demonstrated *post mortem*, support the theory that the cochlea is adapted for the differentiation of sound. Bearing on the same subject, Dr. G. Wilkinson described the mechanism of the cochlea with special reference to the inertia of the contained fluids. Dr. J. E. Bannen described the physiology of the gastro-intestinal tract from the radiological aspect, and Professor A. V. Hill read a paper on athletics and oxygen supply. On Friday, in the same Section, Professor E. P. Cathcart gives his presidential address on "The efficiency of man and the factors which influence it," and a joint discussion on the vitamins is being held with the Section of Agriculture. The opener of this discussion is Professor J. C. Drummond, and the other speakers include Dr. A. Seidell, Professor T. B. Wood, and Dr. J. B. Orr. At the afternoon session Professor Storm van Leeuwen is discussing experimental studies on hypersensitiveness to drug action, to be followed by a paper on the cause and treatment of bronchial asthma, hay fever, and allied conditions. The Section of Psychology opened its proceedings on Thursday morning with a paper by the President, Dr. C. S. Myers, on "Industrial psychology and the efficiency engineer"; Dr. G. H. Miles discussed breakage problems in industry and Mr. Eric Farmer "Output curves as measures of fatigue." In the afternoon Dr. C. H. Northcott discussed "Instincts and society," Miss May Collins gave an account of experiments on colour blindness, and Dr. D. Wynn Jones described the technique of "group testing." To-day (Friday) a joint discussion is being held with the Section of Education on "Psycho-analysis and the school," the principal speakers being Dr. C. W. Kimmins, Dr. Crichton Miller, Dr. Hamilton-Pearson, Dr. R. G. Gordon, and Professor T. H. Pear. A feature of this year's meeting is the daily exhibition in the Reception Room, by arrangement with the Air Ministry, of synoptic weather charts and forecasts. The weather data employed are received by wireless telegraphy from the broadcasting stations in this and other European countries. Demonstrations of the reception and of the decoding and charting of the reports are given by representatives of the Meteorological Office and of the Air Ministry. The meeting closes on September 13th; we hope to publish further notes in our next issue.

PLAGUE IN AUSTRALIA.

AN outbreak of plague which occurred in Sydney has been carefully investigated and efficiently dealt with. Infection was traced to a steamer which arrived from Brisbane in September, 1921, on which there had been a fatal case of plague. Six dead rats were found on this ship, and one of these on bacteriological examination was found to be plague infected, but the others were too putrid for examination. In the two months before the arrival of this ship rats were being continually caught and examined in the neighbourhood

of the wharf at which the ship unloaded, and these animals had never shown evidence of infection, but soon after the arrival of the ship infected rats were caught on the same wharf and in neighbouring workshops. Sixteen cases of plague subsequently developed amongst the civilian population round about the docks; by systematic study of the rat infection in the different localities in which these cases occurred it was possible in nearly every case to trace the connexion between human patient and infected rats. The details of this work are reported in the *Medical Journal of Australia*, May 20th, 1922. We wish to draw attention particularly to the administrative methods adopted to check the epidemic and the new form of antiplague serum employed in treating the cases. Dr. Armstrong states that past experience in New South Wales and Queensland has demonstrated that quarantine measures cannot secure ports from invasion without imposing on commerce such restrictions as would seriously interfere with trade. During non-epidemic periods the measures which must be insisted on are the rat-proofing of wharves and buildings and the maintenance of a detective rat-catching staff whose duties are, not to exterminate rats, but to keep going a continuous nightly trapping of the area which in a seaport town is certain to be the first attacked —namely, the water front. No city, it is argued, would be attacked by plague in which all the buildings were constructed on rat-proof principles, provided care was afterwards taken to prevent rats breeding in them. In Sydney a process of reconstruction is gradually being carried out, and much has already been accomplished in rendering storehouses and other buildings on the wharves as nearly as possible rat-proof by means of concrete flooring and sheeting. When in September, 1921, the fact that Queensland had been invaded by plague was made public the rat intelligence staffs were largely increased; their operations were practically confined to the threatened area, but as the epizootic extended the disposition of the staffs was modified from time to time. Wherever a plague rat was found the premises were immediately quarantined and disinfested. The quarantine consisted in closing up the premises so as to prevent the escape of rats, and forbidding access to the public until the process of disinfestation was completed. This process, which consisted in the destruction of rats and fleas, took several days or a few hours according to the method employed; meanwhile an area comprising several street blocks around the infected premises was intensively searched by the official staff for rats, which were poisoned and trapped. The best method of disinfestation was found to be fumigation with hydrocyanic acid gas; the process is rapid, and kills both rats and fleas. Control rats in cages and fleas in test tubes were buried deeply amongst the goods in the warehouse, and after fumigation was completed the cages uncovered to see if the rats and fleas had been killed. The other method which sometimes had to be resorted to was the turning over of all the stock and movable materials by a gang of workmen and the destruction of rats as discovered. This process took several days, and owing to the survival of the fleas was not so efficacious, but it had to be employed where the hydrocyanic acid gas might possibly reach human beings. Whichever method was used the premises were not released from quarantine until all defects in the buildings had been made good by the owner and rat holes filled up, basements concreted, and the premises put into rat-proof condition. The antiplague serum used for the treatment of the hospital cases was prepared in Sydney by Dr. Burton Bradley, who used a modification of Yersin's method, horses being immunized by dead, and later by living, cultures of virulent plague bacilli. Every plague patient admitted to hospital received the antiplague serum immediately; the results are described as very satisfactory. The total mortality of cases in the outbreak was 25 per cent.; amongst patients admitted to hospital and treated with serum it was 15.4 per cent. In the opinion of the medical officers who had experience of the plague epidemic of 1900–1909 the type of disease in the present outbreak was of equal severity; the mortality of the patients treated with the serum employed at that time was 24 per cent.

PASTEUR COMMEMORATION FUND.

MR. A. CHASTON CHAPMAN, F.R.S., hon. treasurer (in this country) of the Pasteur Commemoration Fund, writes to inform us that a sum of £848 14s. 6d. has been subscribed to this fund, in addition to sums which had previously been sent to France in response to earlier and direct appeals. In accordance with a resolution passed at a recent meeting of the Pasteur Commemoration Committee, presided over by Sir Charles Sherrington, P.R.S., a draft for the above amount is being forwarded to Monsieur Héring, the general treasurer, at Strasbourg, with an intimation that should the amount prove more than the French Committee desires to expend upon the monument the excess should be devoted to some other form of permanent memorial of Pasteur in the University of Strasbourg. We observe that the list of subscribers to the fund includes the names of many well-known firms of brewers, testifying to the debt owed to Pasteur by the brewing industry. Among the individual subscribers is Dr. Horace T. Brown, F.R.S., whose researches into the problems of fermentation, begun more than half a century ago under the inspiration of Pasteur, did so much to apply the methods of science to the art of brewing. The great influence exercised by the pioneers of scientific brewing upon the development of the science of bacteriology in the sixties, seventies, and eighties of the last century is apt to be forgotten. Medicine and surgery, and science at large, owe much to the fermentation industries.[1]

THE NATIONAL MILK CONFERENCE.

A NATIONAL Milk Conference has been convened by the National Clean Milk Society, with the support of a number of other organizations interested in public hygiene, milk production, and the breeding of cattle. The representative appointed by the Council of the British Medical Association is Dr. T. W. H. Garstang, and among the other public bodies represented are the County Councils' Association, the Society of Medical Officers of Health, the Royal Institute of Public Health, the Royal Sanitary Institute, the National Association for the Prevention of Infant Mortality, and the Veterinary Medical Association. The conference will be held in the Council Chamber of the Guildhall, London, on Monday, Tuesday, and Wednesday, October 16th, 17th, and 18th, from 10 a.m. to 1 p.m. and from 2.30 to 5.30 p.m. each day. The President, Viscount Astor, will deliver his inaugural address at the opening session on Monday morning, October 16th, and Sir Arthur Griffith-Boscawen, Minister of Agriculture, will then take the chair. At the afternoon session, under the chairmanship of Mr. Wilfred Buckley, Sir Stewart Stockman will read a paper on "Contagious abortion and other diseases of cattle," and Dr. Stenhouse Williams will open a discussion on the production of clean milk. The morning session of Tuesday, with Sir Alfred Mond, Minister of Health, in the chair, will be devoted to discussions on bovine tuberculosis and its relation to man, opened by Drs. A. Stanley Griffith and Nathan Raw, and on tuberculin tests, introduced by Captain S. R. Douglas, I.M.S.(ret.), F.R.S. The chairman at the afternoon session will be Viscount Elveden. On Wednesday morning, with Sir Walter Morley Fletcher in the chair, a debate on pasteurization and other methods of treating milk will be opened by Professor Georges Dreyer, Dr. Charles North of New York, and Dr. Eric Pritchard. The chairman of the afternoon session will be Sir George Newman, when discussions on the food value of milk and its care in the home will be introduced by Dr. Robert Hutchison and Dr. Leonard Hill, and on education of the public and of the dairy industry in regard to milk by Sir Daniel Hall and Professor H. R. Kenwood. All applications for membership or inquiries for further particulars should be addressed to Miss H. M. Willans, honorary secretary, National Milk Conference, 3, Bedford Square, London, W.C.1.

[1] See "Bacteriology and Brewing," BRITISH MEDICAL JOURNAL, May 20th, 1916, p. 727.

THE EMPLOYMENT OF THE TUBERCULOUS.

THE Glasgow Health Department has issued a valuable report on the employment of the tuberculous. It has been prepared by Drs. A. S. M. Macgregor and John A. Wilson, two of the officers of the department, and records the results of an inquiry into the various types of tuberculous patients with reference to their training and employment. It has a preface by Dr. A. K. Chalmers, the chief medical officer of health. The report investigates the suitability and practicability of the training colony and village settlement system for ex-service men who have the initial advantage of a supplementary source of income as pensioners, and who therefore seem prima facie well fitted for either colony or village settlement. The cases passed under review numbered 785, and the way in which, for one sufficient reason or another, the great bulk of them were held to be unsuitable makes a very interesting story. As being only doubtfully tuberculous on clinical observation and *x*-ray examination, 122 were rejected. Of the remaining 663, in 49 the disease was arrested, in 325 quiescent, and in 289 active, a high standard being applied in making the classification. On the Turban scale 26 per cent. fell into stage I, 48 per cent. into stage II, and the remaining 26 per cent. into stage III. Complications and concurrent affections, especially bronchitis, existed in 161 patients, the great majority of whom were therefore unfit for training in a suitable occupation, and the total cases regarded as medically ineligible were 230. This left 433 for consideration. Most of the cases had been under institutional treatment or otherwise under observation, and the careless, indifferent, or worthless types could, in that way, be separated out. The number rejected or reserved for further consideration on this ground was 191. This left 242. To them there was applied the standard of the Inter-Departmental Committee—namely, training for reintroduction into employment, and of the 242 only 127 could be regarded as eligible. Of these, 110 were already engaged in occupations, many of which were not at all unsuitable—gardeners, tram drivers, travellers, postmen, and the like—while among certain others the exact conditions of employment would be the criterion of suitability. Family ties were an important consideration in making a man stick to his own trade rather than undergo training for a better one. In short, the investigation has led Drs. Macgregor and Wilson to attach weight to the experience of Dr. Noel Bardswell in a report to the London County Council; he stated that of 160 men who passed through the training centres in 1918–21 only nine were still at their newly acquired calling at Christmas, 1921, the remainder of those still alive living on their pensions and being in a state of unemployment. These are anything but encouraging facts. The reporters put the practical question which is being applied to all public health problems in the present circumstances of this country. As to a village settlement they ask, "Would the preventive results be commensurate with the cost?" and they cautiously reply, "The village settlement as a method of treating the individual is admirable; as a public health investment it might not justify its cost."

DR. STEPHEN SMITH.

THE Nestor of Public Health in America has passed away while only a few weeks short of the hundred years which he regarded as "the birthright of every child fully developed."[1] Apparently he had not been very healthy in his early years, as he recorded that, on medical advice, he adopted the profession of medicine "as a preventive measure against the recurrence of a form of indigestion of which I had been a victim from childhood"; and he adds, writing last year, "To that advice I attribute my activities in middle life and the comparatively comfortable age to which I have attained." Indeed, more than half a century ago Dr. Stephen Smith was practising and preaching that combination of conservation of individual health and improvement of environment which is the twofold ideal of the sanitarian to-day. As regards the individual, he set forth ten maxims for longevity, thus: "Eat hardly any meat; drink lots of milk—if it disagrees with you drink more; take a ten or fifteen minutes' nap after luncheon and dinner; sleep ten hours; sleep outdoors when the weather permits; don't smoke; don't eat sweets; take no alcoholic or other stimulants; avoid the easy chair—absence of work is the first step to the grave; finally, just be natural, quit all foolishness." He often said, epigrammatically, "Every man who dies before a hundred practically speaking dies by his own knife and fork." Sometimes a man who has professed to teach the science of longevity has demonstrated in his own death the failure of his scheme; it was not so with Dr. Stephen Smith. So much for the individual. As to environment, he showed in his contribution to the Jubilee Historical Volume of the American Public Health Association (whose first president he had been) that he was both pioneer and leader in the public health movement which began in the United States in the sixties and seventies of last century. His death will be deeply regretted throughout the American continent, but of few men can it be said that, before the end came, life's programme had been carried out as it was in the case of Dr. Stephen Smith. On this side of the Atlantic the sympathy of the public health service in particular will go out to the American Public Health Association in the loss of its doyen sanitarian and first president.

[1] BRITISH MEDICAL JOURNAL, May 20th, 1922, p. 804.

THE FUTURE OF MEDICAL PERIODICALS.

IN the capacity of English correspondent to the journal of the Norwegian Medical Association Dr. Claude Lillingston[2] contributed early this year an essay on the present and future of medical journalism, to which some reference may now be opportune. His main thesis is concerned with the unwieldiness and vain repetitions of medical writings; for every paper containing information both important and new there are, he says, very many that possess neither of these virtues. With journals as with mammals fatness is apt to lead to sterility, and with the growing volume of publications it is becoming increasingly difficult to discover a discovery. Illustrative examples of this state of affairs are given. How, he asks, can the 99 per cent. irrelevant publications be suppressed and the less than 1 per cent. new and valuable information be given the prominence it deserves? The solution which he considers most promising is the development of the abstract—the severely pruned and edited summary of an original article. He finds most abstracts at present dull and lifeless; but as their importance becomes more generally appreciated the work expended on them should, he thinks, improve. An abstract may be made by the simple expedient of "lifting" whole chunks out of the beginning and end of a paper, and adding any sentence the author may have been obliging enough to print in italics. Or the abstractor may read through the original carefully once or twice, pick the whole structure to pieces, and then build up a faithful replica of the original in miniature. Dr. Lillingston suggests that publications such as this journal's weekly *Epitome*, and the monthly publications *Medical Science* and the *Medical Review*, should do something to meet the difficulties discussed, and the tripartite scheme of *Tubercle*, which prints (1) original articles, (2) abstracts, and (3) a bibliography giving only the titles and references of original articles on tuberculosis, ought to satisfy the digestive capacity of every reader in this particular field. But it is doubtful if Dr. Lillingston will prove correct in his forecast that the journal which devotes its pages to abstracts alone will become the generally acknowledged court of final appeal towards which publication *in extenso* elsewhere will be but a preliminary step. Time was when the prophecy was confidently made that man would reduce his dietary to a few compressed tablets a day, but he still prefers his food in bulk; and, however conscientious an abstractor may be, his digest is apt to lack literary vitamins and other intangible, though valuable, properties possessed by the original article.

[2] *Tidsskrift for den Norske Laegeforening*, March 15th, 1922.

TREATMENT AND PREVENTION OF DIPHTHERIA.

A SHORT memorandum on diphtheria[1] recently issued by the Ministry of Health deals with the supply and administration of diphtheria antitoxin, the use of the Schick test, and methods of active immunization for the prevention of diphtheria. In August, 1910, the Diphtheria Antitoxin Order of the Local Government Board authorized local authorities to provide medical practitioners with antitoxic serum for use in the prevention and treatment of diphtheria; the Order required that the arrangements should be made under the supervision of the medical officer of health, and should secure that the medical practitioner who needs a supply of antitoxin from the local authority shall always obtain it without delay. In every case where a provisional diagnosis has been made a dose of at least 8,000 units should be injected as early as possible, without waiting for bacteriological confirmation of the diagnosis. The injection may be subcutaneous or intramuscular, but the latter is to be preferred, as absorption is more rapid. Although no stereotyped procedure can be laid down for subsequent doses it is stated that the experience of the Metropolitan Asylums Board hospitals is that when, in a case seen early in the attack, an initial dose of 8,000 units is followed by definite improvement at the end of about twelve hours further administration of antitoxin is unnecessary. Should there be no evidence of improvement, or if it is clear that the disease is advancing, a second dose of similar magnitude should be given, followed by a further dose if no distinct improvement occurs. Diphtheria antitoxin should not be administered to a person not presenting local signs or symptoms of diphtheria in whose throat or nose the diphtheria bacillus has been found, for there is no evidence that antitoxin has any effect in causing the disappearance of diphtheria bacilli from a chronic carrier. Some abnormality of the throat is often present in such persistent carriers, and this should receive special attention and treatment. A prophylactic dose is rarely necessary for "contacts" if they can be kept under daily observation and antitoxin administered at short notice if symptoms develop. This is especially true of adults. Should a prophylactic dose be deemed necessary it should be 500 to 1,000 units. When the Ministry of Health Report on the Schick Test was published it was considered at length in this JOURNAL (December 10th, 1921, p. 994), and it may be sufficient to point out at present that its object is to determine whether or not healthy persons possess a natural antitoxic immunity, for it has been found by experience that the blood of individuals who possess a natural immunity to the disease contains per cubic centimetre not less than 1/30 unit of antitoxin. To determine whether or not this is present 0.2 c.cm. of a freshly made dilution of standardized diphtheria toxin is injected into the skin, and as a control a similar amount of the same solution, previously heated to destroy the toxin, is also injected intradermally into the opposite arm. If the reaction is positive, indicating a susceptible individual, a circular area of more or less deep red colour appears round about the site of injection in twenty-four hours, while no change occurs on the control arm. This is due to the irritant action of the toxin acting on tissue cells not protected by antitoxin, and indicates that little or no antitoxin is present in the patient's blood, and in consequence susceptibility to diphtheria exists. If there is no change at the site of inoculation the test is negative, indicating immunity to diphtheria. The object of injecting heated toxin into the other arm is to make sure that any inflammatory reaction that appears is not due to a non-specific susceptibility to foreign protein; such a non-specific reaction usually reaches its height in twenty-four hours, and may have faded by the fourth day, whereas a true positive reaction is often most pronounced after ninety-six hours have elapsed. The Schick test has many useful practical applications to diphtheria prevention, more particularly in the case of nurses and others specially exposed to risk of diphtheria infection, and on the occurrence of diphtheria in residential schools and institutions. In susceptible individuals showing a positive Schick reaction active immunity may be induced by inoculations of "toxin-antitoxin," this being a carefully standardized mixture of diphtheria toxin and protective serum. Three separate inoculations of 1 c.cm. should be given at intervals of a week; in adults such injections may be followed by a local reaction or mild constitutional disturbance. The immunity takes some time to develop to its maximum, which is reached in a period of from two to six months, and has been shown to persist for more than six years. Such active immunization is especially valuable for protecting susceptible individuals who are likely to be exposed to infection; because of the slow development of the immunity the work of active immunization should be carried out in interepidemic periods.

[1] Ministry of Health Memo. 68/Med. *Diphtheria*. H.M. Stationery Office. To be obtained through any bookseller. 1d. net.

THE CAMBRIDGE CHAIR OF PATHOLOGY.

THE Chair of Pathology in the University of Cambridge, vacant since the death of Sir German Sims Woodhead at the end of last December, has now been filled by the election of Henry Roy Dean, M.D., F.R.C.P., Professor of Pathology in the University of Manchester and Pathologist to the Manchester Royal Infirmary. The Chair of Pathology at Cambridge was established in 1884. The first holder was Charles Smart Roy, who died in 1897; the next was A. A. Kanthack, who died at the end of 1898, and was succeeded by Sims Woodhead. As Sir Clifford Allbutt said in his introductory note to the *Handbook* of the last Cambridge meeting of the British Medical Association, this professorship "was founded for Roy, a brilliant leader, early stricken down by ill health; as soon afterwards was his no less brilliant successor, Kanthack." The fourth holder was born in 1879, and has had a distinguished career as student, investigator, and teacher. Educated at Sherborne and at New College, Oxford, where he won first-class honours in the Natural Science School in 1900, he was later elected a Senior Demy of Magdalen College. He entered St. Thomas's Hospital with a university scholarship, and afterwards held the posts of medical registrar and resident assistant physician. Tenure of a Radcliffe travelling fellowship was followed in 1912 by Dr. Dean's appointment to the Chair of Pathology and Bacteriology in the University of Sheffield; this he resigned four years later to take up the corresponding post in Manchester. A great opportunity, we believe, awaits him at Cambridge.

THE MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS.

WE publish in the SUPPLEMENT this week, at the request of the Registrar of the General Medical Council, a list of medical practitioners who have not replied to his inquiries as to the accuracy of their addresses. The list includes all untraceable names from A to G in the body of the *Medical Register*, as it is only this section which has come under review in the present year. Any medical practitioner who finds his or her name included in this list should communicate immediately with the Registrar of the General Medical Council, 44, Hallam Street, Portland Place, London, W.1, of the Scottish Branch Council, 20, Queen Street, Edinburgh, or the Irish Branch Council, 35, Dawson Street, Dublin, according to the part of the British Isles in which the name was registered. Since this list was prepared many further inquiries have been sent out, but every practitioner whose name appears in the list would do well to communicate with the Registrar.

WE regret to announce the sudden death on September 5th, while on a visit to Dornoch, of Sir Charles Ryall, C.B.E., senior surgeon to the Cancer Hospital, and a member of the Council of the Royal College of Surgeons of England.

THE office of the *Medical History of the War* is being moved to-day from Stanhope House, Kean Street, Drury Lane, to Imperial House, Tothill Street, Westminster, S.W.1, where it will be opened for work on September 11th, in Rooms 79c, 80, 81, and 83, on the fifth floor.

ANIMAL MECHANISM.

SIR CHARLES SHERRINGTON'S PRESIDENTIAL ADDRESS TO THE BRITISH ASSOCIATION.

AT the inaugural general session of the ninetieth annual meeting of the British Association for the Advancement of Science, which opened at Hull in the City Hall on September 6th, Sir Charles Scott Sherrington, G.B.E., M.D., P.R.S., gave his presidential address on "Some aspects of animal mechanism."

He began by observing that once a year, at the gathering of the British Association, science tried to remove the reproach that it lived too much to itself. These occasions gave the opportunity of talking in wide gatherings about scientific questions and findings. The questions most difficult to answer were often those that could be quite briefly put. Thus, "Is the living organism a machine?" "Is life the running of a mechanism?" The answer certainly could not be stated as shortly as the question, but he proposed to examine some of the points raised.

Mechanical Adjustments in the Human Body.

It might be thought that the problem was presented at its simplest in the simplest forms of life; yet it was in certain aspects more seizable in complex animals.

Our own body is full of exquisite mechanism. Many exemplifications could be chosen. There is the mechanism by which the general complex internal medium, the blood, is kept relatively constant in its chemical reaction, despite the variety of the food replenishing it and the fluctuating draft from and input into it from various organs and tissues. In this mechanism the kidney cells and the lung cells form two of the main submechanisms. And one part of the latter is the delicate mechanism linking the condition of the air at the bottom of the lungs with that particular part of the nervous system which manages the ventilation of the lungs. On that ventilation depends the proper respiratory condition of the blood. The nervous centre which manages the rhythmic breathing of the chest is so responsive to the respiratory state of the blood supplied to itself that, as shown by Drs. Haldane and Priestley some years ago, the very slightest increase in the partial pressure of carbon dioxide at the bottom of the lungs at once suitably increases the ventilation of the chest. And dovetailed in with this mechanism is a further one working for adjustment in the same direction. As the lung is stretched by each inbreath the respiratory condition of the nervous centre, already attuned to the respiratory quality of the air in the lungs, sets the degree to which inspiration shall fill them ere there ensue the opposite movement of outbreath. All this regulation, although the nervous system takes part in it, is a mechanism outside our consciousness. Part of it is operated chemically; part of it is reflex reaction to a stimulus of mechanical kind, though as such unperceived.

The President then turned to another instance of mechanical adjustment, mainly nervous. The postural action of muscles was produced by nerve centres forming a system more or less their own. Maintenance of the erect position involved due co-operation of many separate muscles in many parts. Even in the absence of those portions of the brain to which consciousness was adjunct the lower nerve centres successfully brought about and maintained the co-operation of muscles resulting in the erect posture. He showed how the various harmonies of posture were provided by mere reflex action.

Problems of Animal Mechanism.

All these delicate adjustments and reactions worked involuntarily as a pure mechanism, their analysis being owed mainly to Magnus and de Kleiju of Utrecht.

True, he continued, in such a glimpse of mechanism what we see mainly is how the machinery starts and what finally comes out of it; the intermediate elements of the process we know less of. Each insight into mechanism reveals more mechanism still to know. Thus, hardly was the animal's energy balance in its bearing upon food intake shown comfortably to conform with thermodynamics than came evidence of the so-called "vitamins." Unsuspected influence on nutrition by elements of diet taken in quantities so small as to make their mere calorie value quite negligible; thus, for the growing rat, to quote Professor Harden, a quantity of vitamin A of the order of 1/500 milligram a day. Again, as regards sex determination, the valued discovery of a visible distinction between the nuclear threads of male and female brings the further complexity that in such cases sex extends throughout the whole body to every dividing cell. Again, the association of hereditary unit-factors, such as body colour or shape of wing, to visible details in the segmenting nucleus seemed to simplify by epitomizing. But further insight tends to trace the inherited unit character not to the chromosome itself, but to balance of action between the chromosome group. As with the atom in this heroic age of physicists, the elementary unit assumed simply proves, under further analysis, to be itself complex. Analysis opens a vista of further analysis required. Knowledge of muscle contraction has, from the work of Fletcher and Hopkins on to Hill, Hartree, Meyerhof, and others, advanced recently more than in many decades heretofore. The engineer would find it difficult to make a motive machine out of white of egg, some dissolved salts, and thin membrane. Yet this practically is what Nature has done in muscle, and obtained a machine of high mechanical efficiency. Perhaps human ingenuity can learn from it. One feature in the device is alternate development and removal of acidity. The cycle of contraction and relaxation lies traced to the production of lactic acid from glycogen and its neutralization chiefly by alkaline proteins; and physically to an admirably direct transition from chemical to mechanical effect. What new steps of mechanism all this now opens! To arrive at one goal is to start for others.

Nerve Regeneration.

But knowledge, while making for complexity, made also for simplification, and there seemed promise of simplification in regard to the mechanism of reflex action. Fuller knowledge of the mechanism of the nervous impulse, many of whose physical properties were now known, was leading to a view that nervous function throughout the system was simpler than had formerly been thought. Yet for some aspects of nervous mechanism the nervous impulse offered little or no clue; for instance, the regeneration of the nerve fibre after severance.

Can we, he asked, trace the causes of this beneficent yet so unaccountable reaction? How is it that severance can start the nerve regrowing? How does the nerve fibre find its lost muscle microscopically miles away? What is the mechanism that drives and guides it? Is it a chemotaxis like that of the antherozooid in the botanical experiment drawn towards the focus of the dissolved malic acid? If so, there must be a marvellously arranged play of intricate sequences of chemically attractive and repellent substances dissolved suitably point to point along the tissue. It has recently been reported that the nerve fibre growing from a nerve cell in a nutrient field of graded electrical potential grows strictly by the axis of the gradient. Some argue for the existence of such potential gradients in the growing organism. Certainly nerve regeneration seems a return to the original phase of growth, and pieces of adult tissue removed from the body to artificial nutrient media in the laboratory take on vigorous growth. Professor Champy describes how epithelium that in the body is not growing when thus removed starts growing. If freed from all fibrous tissue its cells not only germinate, but, as they do so, lose their adult specialization. In nerve regeneration the nerve-sheath cells, and to some extent the muscle cells which have lost their nerve fibre, lose likewise their specialized form, and regain it only after touch with the nerve cell has been re-established. So similarly epithelium and its connective tissue cultivated outside the body together both grow and both retain their specialization. All seems to argue that the mutual touch between the several cells of the body is decisive of much in their individual shaping and destiny. The severance of a nerve fibre is an instance of the dislocation of such a touch.

Nevertheless, marvellous though nerve regeneration was, its mechanism seemed blind. Its vehemence was just as great after amputation, when the parts lost could, of course, never be re-reached. Its blindness was sadly evident in the suffering caused by the useless nerve sprouts entangled in the scar of a healing or healed limb-stump. There was a great difference between growth of such regeneration and the growth impulse in pieces of tissue isolated from the body and grown in media outside. New ground was being broken in the experimental control of tissue growth. The following of all clues of difference between the mechanism of malignant growth and of normal growth was fraught with importance which might be practical as well as theoretical.

The regenerating nerve, he continued, rebuilds to a plan that spells for future function. But throughout all its steps prior to the actual reaching the muscle or skin no actual performance of nerve-function can take place. What is constructed is functionally useless until the whole is complete. So similarly with much of the construction of the embryo in the womb for purposes of a different life after emergence from the womb; with the construction of the butterfly's wing within the chrysalis for future flight; of the lung for air-breathing after birth; of the reflex contraction in the foetal child of the eyelids to protect the eye long before the two eyelids have been separated, let alone ere hurt or even light can reach it. The nervous system in its repair, as in its original growth, shows us a mechanism working through phases of non-functioning preparation in order to forestall and meet a future function. It is a mechanism against whose seeming prescience is to be set its fallibility and its limitations. The how of its working is at present chiefly traceable to us in the steps of its results rather than in comprehension of its intimate reactions; as to its mechanism, perhaps the point of chief import for us here is that those who are closest students of it still regard it as a mechanism. But if to know be to know the causes we must confess to want of knowledge of how its mechanism is contrived.

Mind and Body.

At this point the President turned to consider briefly the action of the mind upon bodily mechanism, mentioning that his theme had been partly chosen at the instance of the

late Dr. Rivers, who, as a biologist, viewed mind as a biological factor. While mental actions could not at present be dealt with in terms of nervous actions, or vice versa, something might be gained by considering certain points of contact between the two. His first instance was the so-called expression of the emotions.

The mental reaction of an emotion is accompanied by a nervous discharge which is more or less characteristic for each several type of emotion, so that the emotion can be read from its bodily expression. This nervous discharge is involuntary, and can affect organs, such as the heart, which the will cannot reach. Then there is the circumstance that the peculiar ways and tricks of the nervous machinery as revealed to us in the study of pure reflex reactions repeat themselves obviously in the working of the machinery to which mental actions are adjunct. The phenomenon of fatigue is common to both, and imposes similar disabilities on both. Nervous exhaustion and mental exhaustion mingle. Then, as offset against this disability, there exists in both the amenability to habit formation, mere repetition within limits rendering a reaction easier and readier. Then, and akin to this, is the oft-remarked trend in both for a reaction to leave behind itself a trace, an engram, a memory, the reflex engram, and the mental memory.

Taking examples from various fields the President showed how the features of nervous and mental working resembled each other over and over again. Was it, he asked, mere metaphor to speak of mental attitudes as well as bodily? Or was it mere analogy to liken the warped attitude of the mind in a psychoneuritic sufferer to the warped attitude of the body constrained by an internal potential pain? Yet all this similarity did but render more succinct the old enigma as to the nexus between nerve impulse and mental event. The practical man had to accept nervous function as a condition for mental function without breaking his heart over ignorance of their connexion. The doctor, the lawyer, and the scientist accepted it. Decade by decade the connexion became more ascertained between certain mental performances and certain cerebral regions. The cortex of the forebrain was the main seat of the mind. That cortex, with its twin halves corresponding to the two side-halves of the body, was really a single organ knitting those halves together by a still further knitting together of the nervous system itself. From very small beginnings this great integrating system had become steadily a larger and larger feature of the nervous system, until in adult man the whole rest of the system was relatively dwarfed by it. Physiologically the supreme development of the brain, psychologically the mental powers attaching thereto, seemed to represent to the biologist the very culmination of the integration of the animal mechanism. Moreover, the mental attributes of the nervous system did not stop at the individual; from individuals they integrated communities. That this integration was still developing was obvious from the whole force of human pre-history and history.

The Living Creature a Unity.

In concluding his address Sir Charles Sherrington observed that in some of its aspects animal life revealed mechanism the how of which, despite many gaps in knowledge, was fairly explicable. Of some processes of the living body it might reasonably be expected that further application of physics and chemistry would yield a competent key. But other aspects of animal mechanism still passed comprehension, and the how of the mind's connexion with its bodily place seemed utterly enigma. The lesson nevertheless appeared to be that despite great differences of difficulty in understanding different aspects of animal life it was as a single whole that the animal (and the plant, too) must finally be envisaged. For the living creature was fundamentally a unity, and if for purposes of study it had to be split into part-aspects and part-mechanisms that separation was artificial. To try to comprehend the how of the living creature as a whole was one of the great privileges of the human intellect.

The problem is ambitious, but its importance and its reward are all the greater if we seize and we attempt the full width of its scope. In the biological synthesis of the individual it regards mind. It includes examination of man himself as acting under a biological trend and process which is combining individuals into a multi-individual organization, a social organism surely new in the history of the planet. For this biological trend and process is constructing a social organism whose cohesion depends mainly on a property developed so specifically in man as to be, broadly speaking, his alone, namely, a mind actuated by instincts but instrumented with reason. Man, often Nature's rebel (as Sir Ray Lankester has luminously said), can, viewing this great supra-individual process, shape even as individual his course conformably with it, feeling that in this instance to rebel would be to sink lower rather than to continue his own evolution upward.

England and Wales.

METROPOLITAN ASYLUMS BOARD.

THE report of the Metropolitan Asylums Board for the year ending May 31st, 1922,[1] shows that the Board has had an exceedingly busy time. Into its fever wards in 1921 there were admitted 47,859 cases, against 35,916 in 1920 and 21,962 in 1919. The lowest number under treatment during the year was 5,423 (on September 3rd), and the highest 9,599 (on November 8th). The autumn and winter of 1920–21 had brought the biggest epidemic up to that time experienced in the history of the Board, but it was much exceeded in 1921–22. In fact, the minimum on September 3rd exceeded the maximum of nineteen of the last twenty-five years. The maximum on November 8th was composed of 6,277 cases of scarlet fever, 3,025 diphtheria, 23 of enteric fever, 196 of tuberculosis, and 78 of other diseases. It was only the river ambulance service which made it practicable to deal with these large numbers. As regards scarlet fever, after a conference with the Ministry of Health and the metropolitan medical officers of health, it was arranged that applications for admission would be made in the first instance to these officers, who would advise the Board as to the most urgent cases, preference being given to the poorer and more crowded districts, especially to cases from homes where there was unemployment. This arrangement lasted from October 25th to December 10th, when the need for it ceased. Every case of diphtheria was admitted without the postponement of a single case over a single night.

Experience of cross infection has shown that when scarlet fever, diphtheria, and measles have prevailed simultaneously, 25 per cent. of the total accommodation of the "acute hospitals" should be available for isolation, and the Board has taken special steps to that end. The fatality rate from scarlet fever was only 1.03 per cent., from diphtheria it was 8.25 per cent., from measles 8.44 per cent., and from enteric fever 18.18 per cent. Medical instruction in fever was given to 487 students, and in hospital administration for the diploma in public health to 81.

The admissions to St. Margaret's Hospital for ophthalmia neonatorum were 121 mothers and 213 babies. For ear discharges Mr. T. B. Layton, F.R.C.S., was appointed otologist in 1920, and a special report which he has made is printed in full as an appendix to the Board's report. Of venereal disease 136 cases were admitted to the Sheffield Street Hospital and 60 were treated at the Thavies Inn Infirmary. For influenzal pneumonia two wards were allocated at each of the nine town hospitals, with a total provision of 150 beds, which was found more than sufficient.

Of tuberculosis there were under treatment at the middle of the year 1,906 cases (756 adults and 1,150 children). The institutional accommodation for different classes of cases is stated to be 2,138 beds in all, of which 1,261 are for children and 877 for adults. Of the 877 there are 598 for males and 279 for females. For surgical tuberculosis there are 164 adult beds, and for pulmonary 713: of the latter 321 are for advanced cases and 392 for sanatorium cases. Special provision has been made at Queen Mary's Hospital, Carshalton, for the treatment of surgical tuberculosis in childhood by direct sunlight. For change of air and scene suitable cases can be sent from Carshalton to the seaside home near Littlehampton. At Princess Mary's Hospital at Margate of 271 beds 200 are now in verandas. For surgical tuberculosis in adults a hospital of 164 beds has been equipped at Lowestoft.

Part III of the Report consists of a copy of the statement submitted by the Board to the Royal Commission on London Government. It is naturally an *ex parte* document in support of the Board's own existence as against the views of the London County Council. The Board's presentation of its case is moderate and well argued, and is just such a submission as cannot fail to receive very careful consideration from a Royal Commission. The following is the summary of conclusions given at the end of the statement:

(i) That the interests of efficiency and economy will best be served by making the fewest possible changes in the machinery of local government for some time to come;

(ii) That it is undesirable to concentrate under one authority the whole of the central administrative work whether for the present County of London or for the proposed enlarged county;

[1] Metropolitan Asylums Board: Annual Report for the Year 1921–22. Published from the Office of the Board, Victoria Embankment, E.C.4. (Pp. 176. 5s.)

(iii) That the scheme propounded by the London County Council whether regarded as a whole or so far as it proposes to give any additional administrative work to the Council depends upon—

(*a*) The devolution upon the local authorities of administrative duties in connexion with education, the setting up of an education department under each local authority, and as a necessary consequence

(*b*) The reorganization of the boundaries of the local authorities, both of the existing metropolitan borough councils and of the authorities in the area proposed to be added to London, and their substantial reduction in numbers.

(iv) That the proposed devolution is undesirable in itself, and would be costly in working; and even if carried out to the fullest possible extent would not make room for all the additional work which the Council propose to acquire.

(v) That the area proposed for Greater London (taking, for example, the Metropolitan Police area—the smallest so far suggested) cannot be regarded as constituting a "town" for purposes of local government, but would be a province, and that an entirely new form of local government would have to be devised for it.

(vi) That so far as the work of the Metropolitan Asylums Board is concerned the changes immediately desirable are—

(*a*) The representation upon it of the metropolitan borough councils and the London County Council;

(*b*) The transfer to it of the mental hospitals now managed by the London County Council and of any other institutions which it may be decided to centralize.

(vii) That if further changes are eventually decided upon the setting up of a central Poor Law authority or of a board of public health should be considered.

Scotland.

THE CENSUS OF SCOTLAND, 1921.

County of Aberdeen.

THE county census reports forming part of vol. i of the report on the thirtieth census of Scotland are being issued separately in alphabetical order, so, following the reports of the four great towns (BRITISH MEDICAL JOURNAL for August 26th, p. 399), Aberdeen is the first county to be dealt with.[1] It is amongst the largest and most important, and outside the city of Aberdeen had a population in 1921 of 153,392. Compared with 1911, this is a decrease of 4 per cent., made up of 4,179 males and 2,143 females, totalling 6,322. The highest population recorded was in 1881, when it was 162,801. The area of the county is 1,255,652 acres, so that there are approximately 12 persons per 100 acres. But the county, exclusive of the city, has various burghs, and the burghal population is 1,017 per 100 acres, whilst the non-burghal area averages only 9 per 100 acres. Such figures, it may be noted, have a bearing on the question of medical attendance and mileage allowances in rural districts. In the Deeside district there are only 3 persons per 100 acres, and in the Alford district 5. On a parish basis (some parishes include burghs) there are extreme variations in density. Indeed the term "density" is wisely avoided in the report; "sparsity" would usually be more applicable, but the census confines itself to the phrase per "100 acres." In Fraserburgh parish there are 196 persons per 100 acres, in Peterhead 176, in Inverurie 87 (all these having burghs); at the other extreme, Crathie and Braemar parishes have only one person per 100 acres, Glenbuchat and Strathdon 2, and several others 3 and 4 persons.

Sex and Age.—The ratio of females to males in the county (excluding the city) was 108.4 to 100, as against 105.3 to 100 in 1911. Of the male population 32.9 per cent., and of the female 29.5 per cent., were under 15 years of age. The average age of males was 29.5 years and of females 31.1, as against 27.8 and 29.3 in 1911. Of male children under 15, 9.2 per cent. had lost one parent and 0.6 per cent. had lost both. The 9.2 per cent. is made up of 5.9 fatherless and 3.3 motherless. The orphanhood of female children is similar. Of males aged 15 and over, 50.6 per cent. were married and 6 per cent. widowed. Of females over 15, 45.3 per cent. were married and 10.9 per cent. widowed.

Housing.—The average number of persons per occupied house was 4.7. The number of persons per 100 (windowed) rooms was 107, the lowest on record, the figure in 1861 having been 165; in 1871, 149; in 1881, 139; in 1891, 126; in 1901, 118; and in 1911, 111. This shows a very steady and important improvement in room density, though the position differs in different areas, the statistical worst being Fraserburgh with 161 and Peterhead with 140. Of the total population (excluding the city), 1.9 per cent. live in one-roomed houses, 14.6 per cent. in two-roomed, 24.6 per cent. in three-roomed, 15.1 per cent. in four-roomed, 13.9 per cent. in five-roomed, and 9.7 per cent. in six-roomed houses. These figures are definitely better than those of 1911.

Occupations.—Of the population 12 years old and upwards, 57.8 per cent. had remunerative occupations. The principal occupations, stated as a percentage of the total persons in occupation, were: agriculture, 34.3; personal service, 14.8; commerce (clerks excluded), 6.4; transport and communication, 6.2; wood and furniture, 4.2; making of food, drink, and tobacco, 4.1; fishermen, 4; and professional occupations, 3 8.

[1] Vol. I, Part 5, of Census of Scotland, 1921. H.M. Stationery Office, Imperial House, Kingsway, W.C.2. 9s. net, 9s. 2½d. post free.

County of Argyll.

The population returns of the great but widely scattered West Highland county of Argyll[2] have been seriously affected by the postponement of the census from April 24th to June 19th, there being at the latter date considerable inflation owing to summer visitors, especially in certain localities. The total population was 76,862, or 8.4 per cent. more than in 1911. From 1801 to 1831 the population rose steadily from 81,277 to 100,973; afterwards it gradually diminished to 70,902 in 1911. The burghal population at the 1921 census was 30,111 and the landward 46,751. In the former there was an intercensal increase of 33.9 per cent., but in the latter a decrease of 3.4 per cent. There are six burghs, one of which, Dunoon, a favourite holiday resort in summer, had a June census population of 14,731, being an increase as compared with April, 1911, of no less than 114.8 per cent. The only county district with an increase is Cowal, which adjoins Dunoon. A decrease of 12.7 per cent. in Lorn district is largely explained by an inflation ten years previously of 1 009 men of the Royal Navy. Of the total county population of 76,862, the mainland parishes had 64,242 (12.6 per cent. increase), and the island parishes 12,620 (8.8 per cent. decrease). Omitting two parishes, the mainland shows a decrease from 61,130 in 1831 to 37,176 in 1921—equal to 39.2 per cent. The decrease in the island parishes since 1831 has been from 34,591 to 12,620, or 63.5 per cent.—fully one-third of a mainland loss and nearly two-thirds of an island loss. Indeed, a special recruiting ground of one of the great Highland regiments, the Argyll and Sutherland Highlanders, is sadly affected.

The area of the county is 1,990,472 acres, and the average number of persons per 100 acres is 4. In the burghal portion the average is 914, and in the landward it is 2.

Sex and Age.—The proportion of females to males is 115.5 to 100. In 1911 it was 100.1 to 100, but that census included 1,839 men of the Royal Navy. The average age is 33.6 years—males 32.8, females 34.2, being an increase compared with 1911 of 1.9 for males and 1.5 for females. Of children under 15, 12.6 per cent. had one parent dead, and 1.1 per cent. had lost both parents. Of the male population aged 15 and upwards, 45.5 per cent. were married and 5.6 per cent. widowed or divorced. The corresponding figures for the female population were 39.8 per cent. and 12.5 per cent. The divorced were 10 males and 19 females.

Housing.—The average number of persons per house is 4.59, and of persons per 100 (windowed) rooms 105—a marked improvement on previous censuses. In 1861 the proportion was 181; in 1871, 151; in 1881, 135; in 1891, 121; in 1901, 112; and in 1911, 106. In one-roomed houses there lived 3 per cent. of the population, in two-roomed 22.4 per cent., and in three-roomed 21.1 per cent.

Gaelic Speech.—Gaelic speakers are 32.7 per cent. of the county population, but all these, excepting 0.7 per cent., speak English also. Persons who speak both Gaelic and English have since 1911 diminished by 18.8 per cent. and speakers of Gaelic only by 58.4 per cent. In the islands the Gaelic-speaking population is 77.3 per cent.—a much higher rate than on the mainland, yet a decrease of 11.3 per cent. since 1911. The largest number of persons who can speak Gaelic only are younger children or old people.

Occupations.—Persons aged 12 and over having some occupation were 55.3 per cent. of the population—of males 88.7 per cent. and of females 27.6 per cent. The principal occupations, stated as a percentage of the total persons in occupations, were: agriculture, 22; personal service, 16; transport and communication, 10.2; commerce (clerks excepted), 9.4; metals, 5.7; and professions (clerks excepted), 5.2.

[2] Report obtainable as for Aberdeenshire. Price 7s. net, 7s. 2d. post free.

SCOTTISH WAR MEMORIAL.

There is a proposal, for which considerable funds have been collected, to erect a Scottish war memorial on the Castle Rock, Edinburgh. On this subject Dr. John Stevens of Edinburgh addresses us the following letter:

Sir,—With no special claim to criticize the proposed war memorial on the Castle Rock, and without imagination which soars to sky lines, the writer's only comment is that such a large demolition and reconstruction is inopportune in view of the urgent need of dwellings for the heroes. A Scottish war memorial would, however, be more in keeping with present conditions of national finance and public sentiment were it devised actively to promote the well-being and betterment of the people, not least of those who served and suffered in the war and of their dependants.

The purpose of this letter is to make a suggestion on these lines. It is this:

That, as a thank-offering for deliverance from grave national peril and for the maintenance of freedom, a Scottish fund be raised to place on a secure and enduring basis the provision of trained nursing for all who cannot obtain this benefit for themselves. The establishment of Queen Victoria's Jubilee Institute for Nurses has conferred inestimable blessing on the people of Scotland, but, like the voluntary hospitals, this institution labours under serious financial difficulties. The time is ripe to remedy this as well as to extend the scope of its work.

Let sufficient capital be raised to create a permanent endowment for this institution, which would enable it to provide trained nursing for Scotland adequate to the public requirements, and to continue as a voluntary agency independent of State interference or control. This would constitute a living memorial worthy of Scotland in the highest sense, and it is one which should appeal to the whole population. What investment could yield a comparable return? Such a memorial would form a fitting recognition of all—both men and women—who in any way "did their bit" in the war.

A central building would be required for administrative purposes. This would be the mural evidence of the war memorial, and would bear on its frontage a beneficent answer to the old-world question, "What mean these stones?"

The Queen Victoria Institute for Nurses (Scottish Branch), 26, Castle Terrace, Edinburgh, has for its president and honorary treasurer Princess Louise, Duchess of Argyll. It provides trained nurses for the sick poor all over Scotland. It carries on its work in entire harmony with and under the direction of Scottish medical practitioners, who, we are assured, value very highly the nursing services rendered to their patients. The scope of the work could be greatly extended if funds were available. The institute, which has recently issued an appeal for £27,000, was founded by Queen Victoria, who gave her jubilee gift from British women to improve the nursing of the sick poor. The Scottish council is composed of representatives of a very large number of public bodies, including the medical faculties of Edinburgh and Glasgow, the County and District Nursing Associations, the County Councils' Association, and several trade unions. Its affairs are managed by an executive committee of nineteen persons, of whom four are members of the medical profession; one of the honorary secretaries is Mrs. Chalmers Watson, C.B.E., M.D. All the nurses are fully trained in hospital and have received additional training by the institute to test that they are by temperament and otherwise suitable for district work, and to instruct them in medical work not usually taught in a general hospital but essential to a district nurse. There are at present 450 nurses working from the 313 branches of the institute throughout Scotland.

DR. J. R. CURRIE.

Dr. J. R. Currie, a senior medical officer of the Scottish Board of Health, has been appointed to the Chair of Preventive Medicine in Queen's University, Kingston, Ontario. After graduating M.A.Edin. (1891) he went with a scholarship to Lincoln College, Oxford, and took the B.A. there in 1896 (First Class in Classical Honour Moderations); he proceeded to M.A. in 1910. He resumed his medical education at the University of Glasgow (M.B., Ch.B. with commendation in 1898, and M.D. with high commendation in 1910). While in practice in Birmingham he took the D.P.H. of that University. His early experience of preventive medicine was gained in the sanitary department of the city of Glasgow under Dr. A. K. Chalmers, and in the counties of Stirling and Dumbarton, where he acted in 1906 and 1907 as medical officer of the two counties during the absence of Dr. John C. McVail. In 1909 he was appointed medical officer of health of the city of Chester, and from 1911 to 1912 held the same office in the counties of Fife and Kinross. In 1912 he entered the service of the Scottish Insurance Commission. During the war he held for three years a commission in the R.A.M.C., and saw service in France and Italy. He acted for some months as Chief D.C.M.S. (Scotland) in the Ministry of National Service, while Dr. Norman Walker was C.M.S. On demobilization he returned to duty with the Insurance Commission, and in 1919 he passed into the service of the Scottish Board of Health. He has written a history of medical recruiting in Scotland during the war which will be published shortly.

SCOTTISH BOARD OF CONTROL.

The annual report for 1921 of the General Board of Control for Scotland, which has just been issued, states that there were in Scotland, on January 1st, 1922, exclusive of insane persons maintained at home by their guardians, 18,027 insane persons of whom the Board had official cognizance. Of these 2,975 were maintained from private sources, 14,981 by parochial rates, and 71 from funds voted by Parliament; as compared with the previous year there was a total increase of 221. Excluding transfers, 3,855 patients were admitted to the different establishments; this was 72 more than the previous year and 418 more than the average for the years 1915 to 1919. In addition, 346 persons voluntarily entered establishments for the insane during the year; these persons were not registered as lunatics, and could not be detained for more than three days after giving notice of their desire to leave; 305 private patients (53 less than in the previous year) and 1,005 rate-aided patients (35 more than in the previous year) were discharged as recovered during 1921, and 199 private and 293 rate-aided patients were discharged unrecovered; 1,695 deaths took place during the year, the percentage being 10.1. On January 1st, 1922, there were 2,046 mental defectives on the Board's register, 462 being in certified institutions for adults, 853 in certified institutions for juveniles, and 731 boarded out in private houses.

CENTRAL MIDWIVES BOARD FOR SCOTLAND.

At the recent examination of the Central Midwives Board for Scotland, held simultaneously in Edinburgh, Glasgow, Dundee, and Aberdeen, 133 candidates appeared. Of this number 115 were successful and 18 were rejected.

Ireland.

KILDARE COUNTY HOSPITAL.

DR. P. J. WILLIAMS, medical officer of the Kildare County Hospital, in his report to the hospital committee stated that since his last report there had been 115 patients admitted to the County Hospital, and 88 patients were discharged after treatment. During this period seven patients died.

"On this date [Dr. Williams continues] there are 78 patients undergoing treatment. I desire to draw the attention of the Board to the fact that there is absolutely no equipment yet supplied to the County Hospital, not even that necessary for the treatment of urgent accident cases. I referred to this matter in my last report, when an order was made by the Board that the necessary equipment be supplied, but this has not yet been done. Owing to this lack of equipment I am very heavily handicapped in my work. The Board will realize the gravity of this matter when it is pointed out that during the period covered by this report ten urgent accident cases have been admitted. In all of these cases the proper equipment for treatment was not available. In one case of a young child suffering from a complicated fracture of the femur, I was compelled, owing to the absence of the necessary appliances, to requisition the aid of the carpenter in improvising a splint. This was not a satisfactory method of dealing with the case, and is unfair both to the patient and to myself. Furthermore, in an urgent case brought here by the police, notwithstanding the fact that the patient was in a very weak condition from loss of blood, I was compelled to subject him to a further journey to Kildare Infirmary owing to the absence of instruments or appliances necessary for his treatment here. I would suggest the Board give this whole matter their very serious attention, as complete equipment for the hospital is urgently required."

The Committee made an order that the matter should be immediately forwarded to the Local Government Department with a request that it should sanction the necessary articles without further delay.

MEDICAL OFFICERS' HOLIDAYS.

Arising out of the decision of the co. Kilkenny Board of Health to reduce the remuneration of medical locumtenents a meeting of the co. Kilkenny medical practitioners was recently held, when the resolution was unanimously passed:

> That we, the medical practitioners in the County Kilkenny, refuse to do ordinary vacation or sick-leave duty at a smaller fee than £6 6s. a week.

It was also agreed that the fee of £8 8s. a week be charged for temporary duty for the combined offices of Thomastown dispensary district and the county home. The following undertaking was also drawn up and has been signed by practically all doctors practising in the co. Kilkenny:

> I hereby promise not to accept any appointment from any public body unless the terms of the appointment are in agreement with the opinion of the medical profession in the co. Kilkenny and not to act independently of the profession in any matter in which the interests of the profession are concerned.

APPOINTMENT OF A MEDICAL OFFICER.

We have received the following letter with reference to a paragraph published on August 26th (p. 400):

Swanlinbar, co. Cavan.
August 28th, 1922.

Sir,—I notice in your issue of August 26th (p. 400) a note *re* the appointment of the medical officer at Dowra Dispensary District, co. Cavan. Evidently you have not been informed by your Irish correspondent that I at once sent in my resignation to the committee when informed of the true facts of the case.—I am, etc.,
A. J. O'REILLY, L.R.C.S. and P.I.

We congratulate Dr. O'Reilly on the course she has taken. In such matters it is of the utmost importance to maintain the solidarity of the profession.

Correspondence.

THE PLACE OF VERSION IN OBSTETRICS.

SIR,—Your review (August 26th, p. 385) of Dr. Potter's monograph *The Place of Version in Obstetrics* raises a number of interesting questions. Most obstetricians will agree with you that the results quoted are excellent. But while one is compelled to accept the percentages, it does not by any means follow that the method which in his hands gives such results would give the same if universally adopted. It is not, at present, every midwifery case attended in this country which has the advantages of the surgical preparation and the aseptic precautions which are absolutely demanded by version as a routine practice, and I therefore think your criticism is very salutary.

Then, again, while there has been no maternal mortality in 938 cases, what is to be said about the morbidity? It is unthinkable that the morbidity is as low by routine version as by the usual conduct of a labour, because there must be a certain proportion of cases where in any intrauterine interference infection is carried from the vagina by a perfectly sterilized finger or hand or rubber glove. A glove is no guarantee against an infected vagina, and in ideally conducted midwifery cases, of the total number of infections, a large percentage must have their origin in the vagina and not in forceps, etc.

It is not an easy matter to impress students with the vital importance of not attempting to extract an infant rapidly (which usually results actually in prolonged effort) when such an excellent handle for traction is apparently provided by the partially born infant's legs. I should think there is no stronger temptation to the inexperienced in the whole range of midwifery, and to perform version unnecessarily is only inviting this temptation.

Respecting the diagnosis of presentation and position, one can only say that reliance entirely on the sutures and fontanelles is surely somewhat archaic. Almost every case can, by the experienced, be diagnosed accurately by abdominal palpation, and there is no excuse for the repeated vaginal examinations in vogue some years ago. My practice is to examine abdominally about four weeks before term and again a few days before. Such examination reveals that the textbook statements of the percentage of occipito-posterior presentations is far too low; at the same time there are certainly not 60 to 70 per cent. of presentations that are occipito-posterior—at least, not in this country. Without consulting my records I would roughly estimate occipito-posterior presentations at 20 to 25 per cent. Then a further number occur where the head must fairly be described as occipito-transverse, a few of which certainly first rotate to occipito-posterior. If one could be sure that any given case would remain persistently occipito-posterior, version would be an excellent treatment, but there is no means of knowing certainly that such a case will be persistent, and by the time this is certain version is, of course, impossible. I agree that palpation of an ear, if it can be reached easily and if one must diagnose by the vagina, is an absolutely final word on the presentation.

But why internal version? If one decides to do version, external version is, in the majority of cases, quite simple. It is to be noted that when an anterior arm is brought down and the body rotated to bring the posterior arm forward, if the position up to this point has been occipito-posterior it means either that the head is rotated into the opposite posterior occipital position or that the occiput must in all cases be rotated at least a full half-circle, which latter is not always easy. If this is always possible there is no object in performing internal version as distinct from external version in order to secure an occipito-anterior presentation of the aftercoming head.

Malposition must always be a somewhat relative term; thus, a slightly more oblique uterus than normal would give a slightly increased tendency to transverse presentation when labour began, but as a fact the majority still remain vertex presentations.

In spite, however, of these criticisms I believe, as does the writer of the review, that the interest in version will be stimulated, for it might with advantage be resorted to more often than it is.—I am, etc.,

W. OSBORNE GREENWOOD, M.D., F.R.S.Edin.

Harrogate, Aug. 28th.

CLAYDEN *v.* WOOD-HILL.

SIR,—Will you kindly allow me to thank the Council of the British Medical Association for the help it gave me, on the announcement of the verdict given against me in the case of Clayden *v.* Wood-Hill? Its offer of legal assistance and its sympathetic attitude I most deeply appreciated.

I owe a great debt of gratitude to Sir Hamilton Ballance and the signatories of the appeal fund, which raised so large a sum (£1,731) to meet the financial loss which the case entailed.

As may be realized, the sum so subscribed has been of the greatest relief to me; but, great as that relief has been, the feature that has given me the more satisfaction is that the leading men of the profession, with so vast a number of my professional brethren—men representative of all parts of the British Empire, and mostly personal strangers—should have rallied so generously to my aid. It bespeaks the view taken by our profession as to the injustice of the verdict. As an expression of good fellowship it is most remarkable. It has been to me a rainbow in a stormy sky.

The practice of our profession calls for courage and confidence; my colleagues have helped me to retain both. They may rest assured that I shall apply my powers, such as they are, conscientiously and in good faith, without regard to fortune, good or bad. "Of good fortune man should not be proud, for it is a present to him; at bad fortune he should smile, for the Fates have singled him out, to try his courage."—I am, etc.,

Beccles, Suffolk, Sept. 2nd. H. WOOD-HILL.

NATIONAL ASSOCIATION OF OPTICIANS.

SIR,—I read with interest Mr. Cyril Jacobs's letter in the JOURNAL of August 19th on the National Association of Opticians, a subject of great importance to all ophthalmic surgeons.

I quite appreciate Mr. Jacobs's feelings, but now that the optician is an established entity it is too late to say, "We do not want this new class of practitioner!" What we must say is, "We do not want this class of practitioner to exceed the limits of his province!" It is quite true that the qualified opticians are actively trying to get State recognition, and I, for one, will welcome the day they obtain it, provided the craft have a definite limitation of activities—namely, sight testing and spectacle making only.

I agree that the movements of the National Association of Opticians need to be carefully watched. It was instituted about 1910; why, I do not know. All opticians rushed to join it without thinking, and at the present time the qualified optician is pretty well disgusted to find that the majority of the members are unqualified by examination, and that they make a prominent display of a certificate as "Member of the National Association of Opticians." This, of course, is misleading to the public. I cannot help feeling that the National Association is very misleading altogether, and if it is not I should like to see its hand exposed.

At present there are two highly estimable bodies which conduct very difficult examinations for opticians—namely, the Worshipful Company of Spectacle-makers and the British Optical Association. The papers set are a revelation in optics, and only those who go through a protracted course of study and who work hard can ever hope to pass, the result being that unqualified opticians far outnumber those who have passed one of these examinations.

Now what happens? The National Association, having in view a probable legal status for opticians, institutes a very elementary examination, compared with the Spectacle-makers' Company and the British Optical Association, and so

enables one who is unable to pass the aforesaid to style himself "qualified by examination." My own view is that this is wrong and altogether undesirable.

Between the unqualified and the qualified there is such competition that one finds innumerable examples of "not playing the game." It is astounding what one does come across in the way of patients being imposed upon.

There is only one solution to the problem, and that is to give the opticians a charter, and bind them down to observe strict etiquette, as in the case of the medical profession. This would act as does the *Dentists Register* and stop any but the qualified practising.

Opticians are now here to stay. No medical man can prevent any of his patients going to an optician to be tested for a pair of glasses, even though he advise them not to do so. It behoves the medical profession therefore to try and get a Register for Opticians, allowing them reasonable privileges. It is a duty also to the public, who are not conversant with the limitations of the optician's skill. The lay person always attributes failing sight to the want of spectacles, and not infrequently visits an optician, often to his detriment.

I have known a qualified optician sell a pair of glasses to a man with double optic atrophy, who was only able to distinguish light. I have also known a qualified optician sell glasses to a girl of 12 years who was suffering from double lamellar cataract, and whose best vision with glasses was 6/36. This girl's mother was told that it was a difficult case, and that the glasses would have to be changed frequently in order to work gradually up to the required strength of lens. Again, I have known an unqualified optician supply frequent changes of glasses to a man with simple glaucoma. This person on examination was found to be blind in the right eye, and to see only 6/36 with the left eye.

The Spectacle-makers' Company and the British Optical Association supply certificates to those who have passed their examinations on the following conditions:

1. That they refer to a medical man all cases of subnormal vision that cannot be brought up to normal with glasses; all cases of squint in school children; all cases of obvious disease.
2. That they do not canvass for spectacles.
3. That they do not use drops for purposes of refraction, except in collaboration with a medical man.

I have known every condition violated by diploma holders. I think it is high time something was done by the medical profession to get an Opticians' Register. This would mean the optician conforming to a definite code of ethics and tend to produce a better class of work; moreover, it would stop the travelling quack optician who goes up and down the country, and who is helped by many newspapers publishing astounding advertisements—a type of optician who is a menace to the public.

There is a growing tendency to teach the optician to recognize fundus disease, and with this I am in agreement, but I do want an assurance that there will be no attempt to treat disease of any kind. If an optician wishes to do more than test refraction, then it is up to him to qualify in medicine and surgery.

What is this movement that is afoot to form a kind of panel with the backing of approved Insurance Societies, in which the optician is to be paid so much for supplying glasses and so much for sight testing? Does the British Medical Association know anything about it?

Now that the matter of optician *versus* oculist has been opened up for discussion I hope it will be thoroughly thrashed out.—I am, etc.,

Middlesbrough, Aug. 21st. J. PARKINSON HIGHAM.

*** The movement referred to in the penultimate paragraph is within the cognizance of the Insurance Acts Committee, and is being carefully watched and dealt with as far as possible.

STERILIZATION OF MENTAL DEFECTIVES.

SIR,—In the interesting letter of Sir G. Archdall Reid in your issue of August 26th he says that if he is correct in his reasoning, a single idiot may taint the whole race. That is exactly my contention; therefore the sterilization of mental defectives, although excellent, is not enough. We ought to prevent their advent in the future by sterilizing those who are certain, from pronounced family history, to produce idiots. The strongest argument in favour of my suggestion is heredity. Nageli calls the hereditary substance represented by the sexual pro-nuclei which fuse together in the act of fertilization by the name of "idioplasm." The resulting germ contains the images of two individuals, and is therefore capable of transmitting by heredity their characters to the individual developed from it. Professor Luciani says that we are forced to admit the hypothesis that the development of the germ does not consist in a new form, or epigenesis, but rather in the transformation of a model or rough sketch into a complete organism, capable, in its turn, of forming a model similar to that from which it was itself derived.

My suggestion means a State certificate of marriage, and the power of withholding it in the case of either the male or the female who refuses sterilization, which would in no way interfere with married life. At the present moment there are over 12,000 registered mental defectives for whom we are taxed. The logical conclusion is that the effect of a State certificate of marriage would be a healthy race, with no necessity for sterilization. But although the majority may agree to this State certificate, it will take a long time to make it law, for the general public, in spite of the natural desire to have healthy children, are indifferent.

I must not further trespass on your space, but may refer anyone interested in the subject to the paper on "Sterility with reference to the State" recently brought by me before the Obstetrical Section of the Royal Society of Medicine, and published in your issue of March 18th (p. 427); the discussion which followed was reported in the same number (p. 438).—I am, etc.,

London, S.W., Aug. 28th. R. A. GIBBONS.

SIR,—In his interesting and instructive letter published in your issue of August 26th Sir Archdall Reid tells us that the statement that acquired characters are (or are not) inherited depends on a misuse of terms. He further declares that the reproduction (not inheritance) of abnormalities (for example, idiocy) is alternate. As this statement is directly contrary to Mendelian teaching, and as Sir Archdall Reid's views on this important subject appear to be entirely unorthodox, it would be interesting if he would tell us why he thinks that the statement that acquired characters are (or are not) inherited depends on a misuse of terms. His reasons for disagreeing with the Mendelians are not apparent.—I am, etc.,

W. BASTIAN,
Portsmouth, Aug. 28th. Surgeon Commander R.N.

SIR,—It would indeed be surprising if it were possible to find a flaw of fact or reasoning in a letter by so erudite a scholar as Sir Archdall Reid on a subject in which he is *facile princeps*. It is only in the last line of his letter that difference of opinion can occur—namely, that the necessary conclusion is sterilization.

Segregation has not so far been properly tried in the case of mental defect, and, although expensive, if our data are correct it should be a steadily diminishing expense, and should be, as it has been put, "a good long-term investment." Taking legislation, of a sterilization type, as against mental defect, I would fear the results to the community of the former more than the latter.—I am, etc.,

Melton, Suffolk, Aug. 28th. JAMES R. WHITWELL.

THE ECONOMICS OF PUBLIC HEALTH.

SIR,—In the discussion (p. 341) on Colonel Fremantle's admirable paper the report might suggest that I said that "too much was being spent on public health services." Such was not the meaning intended at all events. Glasgow was only intended as an illustration, but now we know (see JOURNAL for August 26th, p. 399) that out of a population of over a million over 600,000 persons live in one-roomed or two-roomed tenements. Such a state of affairs passes the comprehension of the most imaginative, but no wonder that Glasgow is a centre of unrest. It all emphasizes the point, however, that large sums of money will have to be spent to remedy these ills, and that from the statesman's point of view economy in spending the money will only be achieved by getting the utmost value for the money spent. This may mean bold and imaginative action; but who can doubt that such action, which would give a large measure of health to all, will really result in immediate economy to the State in lives saved, and a higher quality of life for thousands?—I am, etc.,

Letchworth, Aug. 27th. NORMAN MACFADYEN.

BOTULISM.

SIR,—With regard to the eye symptoms in botulism, I would like to mention the following case:

At midnight on August 8th I was called to see Mrs. C., aged 32. About 6 p.m. she had eaten a portion of corned beef from a three-quarter pound tin, and with it some

tomatoes. About 7 p.m. she had a feeling as if she had been hit on the right side of her head. When she went up to bed at 8 p.m., she fell full length on the bedroom floor. At 10 p.m. she vomited the beef and tomatoes. When I saw her she was hot and flushed; could not raise her head without feeling everything in the room going round. She complained of diplopia. There was very marked nystagmus. She was retching from 2 p.m. till 1 30 p.m. next day. She did not sleep for two nights. There was no diarrhoea. The nystagmus lasted till Thursday, August 10th, and the diplopia till Saturday. On Sunday she could read steadily. On August 26th there was still some pain on the right side of the head, but otherwise she was quite well. I have never seen before such a combination of symptoms. Two children partook of small portions of the same food, but suffered no ill effects. —I am, etc.,

Helston, Cornwall, Aug. 28th. FERDINAND REES, M.D.

SOME CAUSES OF LONGEVITY.

SIR,—It is important that scientists should not be led astray by the popular ideas of the passing day.

In this decade, when men's minds tend to become obsessed with the potency of suitable injections and inoculations, it is well to recall the important problems of dietary in their relation to longevity.

Dr. Smith, the first graduate of the American College of Physicians, who has just died as a centenarian, laid down as his first maxim of extended life and health, "Eat hardly any meat," and as his second, "Drink lots of milk."

My experience in dietetics would lead me to modify and add to these maxims as follows: (1) Eat no flesh food. (2) Drink fresh milk or naturally soured milk, but avoid all milk which is prevented from souring by antiseptic preservatives or by boiling. (3) Use oils freely. (4) Make use of days of abstinence and periods of fasting.

These are modifications of old sanitary laws of dieting evolved by age-long experience and are based upon the principle that the commoner causes of illness and early decease result from the presence of pathogenic organisms in the intestines, whence they become ambulatory and invade other organs, and that an alimentary canal should permanently contain only those organisms that are beneficial to the functions of digestion.—I am, etc,

London, W., Aug. 30th. JOSIAH OLDFIELD.

Obituary.

WE regret to record the sudden death on August 17th of Dr. W. P. WARREN of Enfield from cerebral apoplexy. He was born at Cork in 1860, and studied first at Queen's College and subsequently at Edinburgh and St. Bartholomew's Hospital. He took the diplomas of L.R.C.P., L.R.C.S. and L.M.Edin. in 1882, and the D.P.H. in 1908. He settled in practice at Enfield Highway in 1888, and lived and worked there for thirty-four years. In the course of some years he became the senior partner in a firm of four men who had in their hands the whole medical practice of the huge and now thickly populated district between Waltham and Tottenham. In 1908 he was appointed medical officer of health for Enfield, a post in which he was eminently successful and did most valuable work in the district which came under his care. His personal popularity with his colleagues made them all most eager to help him. He paid special attention to the spread of epidemics, and had a keen gift of tracking down and isolating carrier cases which were helping to spread disease. By his efforts infantile mortality decreased considerably in the district and the general death rate as well; for some years Enfield had the distinction of smaller infantile and general death rates than any other place in London or England and Wales. His wise advice and experience were often sought by his colleagues in cases of outbreaks of infections and were readily and cheerfully given; it is doubtful if there was a medical officer of health in any town or district who was a more general favourite amongst his colleagues. Personally they will all miss him very much; he was *persona grata* at all medical meetings and dinners in the neighbourhood. He filled many posts, such as police surgeon, surgeon to many Oddfellows' and Foresters' lodges, parish medical officer and vaccinator, and was a very eminent member of the Masonic Order. He leaves two sons who worked with him of late years in his practice.

WE regret to record the death of Dr. CLEMENT JOHN BAKER, which took place on August 7th at sea while he was on his way home from Uganda. He had almost completed twenty years in the Uganda Medical Service. He was born at Yoxall Rectory, Staffs, in 1872, and was educated at Bury St. Edmunds Grammar School and Middlesex Hospital. He took the diplomas of M.R.C.S.Eng., L.R.C.P.Lond. in 1898; he was house-surgeon at Middlesex Hospital, and after two years in private practice went to the Boer war as civil surgeon (1901–2). While medical officer at Entebbe he found a trypanosome in the blood of a prisoner, and was the first to announce publicly the discovery of trypanosomes in human beings in Uganda. Dr. Baker was appointed the first chief sanitary officer for the Uganda Protectorate, and held this post at the time of his untimely death. He was a most popular officer, and will be much missed among all classes of the community of Uganda. He leaves a widow, and we extend our sympathy to her, and also to his mother and other relatives.

NINIAN ALEXANDER WILLIAMSON, M.D., late Assistant Surgeon A.M.D., died at Carzield, Kirkmahoe, Dumfriesshire, on August 12th, aged 80. He was born on November 16th, 1841, and entered the army as assistant surgeon on March 31st, 1868, serving for eight years in the 7th Dragoon Guards, or Black Horse, but resigned his commission early in 1877, since when he had resided on his property at Carzield. He took an active part in public affairs, and was, or had been, a member of the Dumfries County Council, of the Kirkmahoe Parish Council, of the Kirkmahoe School Board, and a director of the Crichton Royal Institution, Dumfries. His wife predeceased him some eighteen months ago.

The Services.

AUXILIARY R.A.M.C. FUNDS.

AT the last quarterly committee meeting of the Auxiliary Royal Army Medical Corps Funds grants were made to cases in the Benevolent Branch for the orphans of officers amounting to £530, and grants in the Relief Branch for the widows and children of rank and file amounting to £317. These funds are for the relief of widows and orphans of commissioned officers and non-commissioned officers and men of the rank and file of the Royal Army Medical Corps, Special Reserve, Territorial Force, and New Armies, and also for the relief of the children of those who have been so severely disabled in the late war that they need help for the education of children. Requests for relief should be addressed to the Honorary Secretary at the offices of the Funds at 11, Chandos Street, Cavendish Square, W.1.

LECTURES ON DENTAL HYGIENE.

THE Admiralty, with the view of encouraging proper care of the teeth and to maintain a high standard of dental health, has given orders that dental officers are to supplement, by a series of lectures on oral hygiene, the individual instruction given to patients attending for treatment. Suitable lantern slides for lectures will be supplied by the Lantern Lecture Department at the Royal Naval College, Greenwich, and special slides will, if necessary, be prepared from illustrations. The lectures are to be given monthly at the training establishments and dépôts, or as frequently as the commanding officer may consider desirable. All new entries must attend as part of their general instruction; the attendance of other ratings is voluntary.

DEATHS IN THE SERVICES.

Deputy Surgeon General William Howland Roberts, Madras Medical Service (retired), died at Chelsea on August 16th, aged 87. He was born on September 29th, 1834, and educated at Edinburgh, where he graduated as M.D. in 1855. Entering the I.M.S. as assistant surgeon as July 23rd, 1858, he became D.S.G. on July 1st, 1888, retiring on July 1st, 1893. He served in the Burma war in 1886–87, was mentioned in dispatches in G.G.O. No. 474 of 1887, and received the medal.

Colonel James Francis Supple, C.B., R.A.M.C.(ret.), died suddenly at Haywards Heath railway station on August 8th, aged 78. He was born at Waterford on December 14th, 1843, and educated in Dublin, and after taking the L.R.C.S.I. in 1865 and the L.K.Q.C.P. in 1866, entered the army as assistant surgeon on April 1st, 1867. In the regimental days he served in the 1st Foot, the Royal Regiment, or Royal Scots. After thirty years' service he attained the rank of colonel on May 29th, 1898, and was granted the local rank of surgeon general while serving as P.M.O. at the base in Cape Town in the South African war, on November 18th, 1899, retiring on December 14th, 1903. He served under Sir Garnet Wolseley in the Ashanti campaign of 1873–74, in the defence of Foomanah, medal with clasp; in the Afghan war of 1878–80, medal; in the Burma campaign in 1886–87, as senior medical officer of the 6th Brigade, mentioned in dispatches, *London Gazette*, September 2nd, 1887, medal; and in the South African war in 1899–1900, as P.M.O. at the base, mentioned in dispatches, *London Gazette*, April 18th, 1901, Queen's medal with clasp, and C.B.

Lieut.-Colonel Algernon Francis Stevens, Bengal Medical Service, died of cholera at Gaya on August 20th, aged 51. He was born at Arrah in Behar, on August 30th, 1869, the son of the District magistrate, Mr. C. C. Stevens, afterwards Sir Charles Stevens, K.C.S.I., Lieutenant Governor of Bengal. He was educated at Bart's, and took the M.R.C.S. and L.R.C.P.Lond. in 1893, after which he entered the I.M.S. as surgeon-lieutenant on January 29th, 1895, attaining the rank of lieutenant-colonel after twenty years' service. His first five years were spent on military duty. In 1900 he entered civil employ under the government of Bengal and Bihar, and served as civil surgeon of many stations—Arrah, Gaya, Hughli, Ranchi, and others. In October, 1915, he reverted to military duty, at which he remained for the rest of the war, and up till December, 1920, when he returned to civil work. He served in medical charge of the hospital ship *Erinpura* from June, 1916, to December, 1918. His elder brother, Lieut.-Colonel C. R. Stevens, also of the Bengal Medical Service, after also serving in the late war, died on November 18th, 1919.

Lieutenant-Colonel Donald Elcum, Madras Medical Service (retired), died in a nursing home in London on August 11th, aged 69. He was born on May 28th, 1853, the son of Dr. Charles Frederick Elcum, of Cheltenham, educated at Cheltenham College and at Guy's, and after taking the L.S.A. in 1875 and the M.R.C.S. in 1876, entered the I.M.S. as surgeon on March 31st, 1877. He retired as surgeon-major on March 10th, 1895, but was promoted to lieutenant-colonel from October 18th, 1902, for services in England in connexion with the South African war. He served in the Afghan war of 1878–80, medal; in the Burma war in 1886–87, mentioned in dispatches, G.G.O. No. 434 of 1887, medal; and in the war of 1914–19, mentioned in dispatches in *London Gazette* of January 22nd, 1919, and June 5th, 1919. For some years past he had held the appointments of examiner of surgical instruments and extra member of the Invaliding Board of the India Office.

Major Patrick Sampson, D.S.O., R.A.M.C., died at Cricklade on August 30th, aged 41. He was born on January 4th, 1881, the son of M. Sampson, Esq., of Knocklong, Limerick, and educated at Queen's College, Cork, taking the double qualification of the Irish Colleges in 1903, and subsequently their D.P.H. in 1913. Entering the R.A.M.C. as lieutenant on January 30th, 1906, he became captain after three and half years, and major after twelve years' service. He served in the war of 1914–18, was thrice mentioned in dispatches, in the *London Gazette* of December 1st, 1914, February 17th, 1915, and January 1st, 1916, was wounded, and received the D.S.O. on December 1st, 1914.

Captain Charles Leslie Grove Powell, M.C., R.A.M.C., died of heatstroke at Multan on July 18th, aged 30. He was born on February 17th, 1892, and educated at St. Thomas's. He took the M.R.C.S. and L.R.C.P.Lond. in 1915, and immediately entered the R.A.M.C. as a temporary lieutenant on May 7th, 1915, becoming captain after a year's service, and received a permanent commission, ranking as captain from November 7th, 1918. He served in the recent war, was mentioned in dispatches in the *London Gazette* of June 15th, 1916, and received the Military Cross on November 17th, 1917.

Medical News.

DR. F. J. WALDO has received many congratulations on the completion of twenty-one years' service as coroner of the City of London and Southwark. Dr. Waldo, who is a barrister as well as a medical man, was the first medical officer to the Inner and Middle Temples. At its last meeting the Court of Common Council, in order to mark its appreciation of his services, voted Dr. Waldo an annual increase in his remuneration of £150.

AT the opening of the winter session of the Middlesex Hospital on Tuesday, October 3rd, at 3 p.m., the introductory address will be given by Professor Sidney Russ, D.Sc. (Joel Professor of Physics), after which the prizes will be distributed by H.R.H. Princess Alice, Countess of Athlone. The annual dinner will be held at the Trocadero at 7.30 p.m. on the same day. Mr. Sampson Handley, M.S., will preside. Those wishing to be present at the dinner should communicate with the Secretary-Superintendent of the hospital.

THE annual dinner of the past and present students of Westminster Hospital will be held at the Wharncliffe Rooms, Hotel Great Central, on Monday, October 2nd. Mr. Arthur Evans, M.S., F.R.C.S., will take the chair at 7.30 p.m. The secretary is Dr. Adolphe Abrahams, 17, Harley Street, W.

A POST-GRADUATE course in medicine, surgery, and pathology will be held at the Radcliffe Infirmary, Oxford, from October 2nd to October 7th. The course will comprise morning sessions from 10.30 a.m. to 1.30 p.m., and afternoon sessions at 2.30 p.m. and 4.30 p.m. Tea will be provided in the library each afternoon at 4 p.m. A dinner will be held in Queen's College Hall at 7.30 p.m. on October 7th. A limited number of those attending the course may be accommodated in rooms at Queen's College, for which early application should be made to the Bursar, Queen's College. The fee for the course is 1 guinea for practitioners in the hospital area and 2 guineas for new members from elsewhere. Further information may be obtained from the secretaries of the post-graduate course, Radcliffe Infirmary, Oxford.

THE annual dinner of the past and present students of St. Mary's Hospital Medical School will be held at the Connaught Rooms, Great Queen Street, W.C., on Monday, October 2nd, at 7 for 7.30 p.m. The chair will be taken by Sir Leonard Rogers, C.I.E., F.R.S. The secretary is Dr. A. Hope Gosse, 15, Queen Anne Street, W.1.

THE programme of the North-East London Clinical Society for the session 1923–23 has been issued. The opening meeting is arranged for Thursday, October 5th, at 4.15 p.m., when a lantern lecture will be given by Sir Archibald Reid on "The *x*-ray examination of the pyloric end of the stomach and its vicinity." The annual dinner will be held on October 12th, at 8 for 8.15 p.m., at the Prince of Wales Hospital, Tottenham. Subsequent clinical meetings will be held at the beginning of each month from November to June inclusive.

DR. HARVEY CUSHING has been awarded the Charles Mickle Fellowship of the faculty of medicine of Toronto University. He has stipulated, however, that the money, which amounts to 1,000 dollars, shall be used to send a graduate of Toronto University to Harvard to work with him. The Charles Mickle Fellowship, endowed by the late Dr. W. J. Mickle, is awarded annually to the member of the medical profession anywhere who is considered to have done most during the preceding ten years to advance sound knowledge of a practical kind in medicine. The first award was made last year to Professor Pavlov of Petrograd.

THE following courses of lectures and demonstrations will be given during the coming autumn term at the Royal Sanitary Institute: a course for sanitary officers, commencing on September 27th; a course for meat and food inspectors, commencing on October 6th; and a course for women health visitors and child welfare workers, commencing on September 29th. Dr. Louis C. Parkes will give an introductory lecture to the students in the several courses on September 25th at 5.30 p.m. Further information can be obtained from the Secretary of the Institute at 90, Buckingham Palace Road, S.W.1.

THE Post Office has issued a circular stating that it is endeavouring to make up leeway, and is, in particular, actively engaged in developing telephonic facilities in rural districts. It is estimated that out of 3,110 existing exchanges 1,930 serve purely rural districts. In addition the service has been extended in the form of a public call office to 2,250 villages where no exchange exists. Attention is being given to the extension of automatic telephony. Automatic exchanges are already working in sixteen places. The largest automatic exchanges are at Leeds, with 9,600 lines, and Portsmouth, with 5,000 lines. Works are now in hand for converting to the automatic principle the exchange systems at Sheffield, Dundee and Broughty Ferry, Gloucester, Gosport and Brockhurst, Kirkcaldy and Dysart, Shrewsbury, Southampton, Swansea, Torquay, and York, while over thirty other schemes are being developed. The sum of £2,230,000 is being spent this year on the development of the trunk wire system.

THE "European Student Relief" of the "World's Student Christian Federation" has appointed a committee to co-operate with the "Universities' Library for Central Europe," co-ordinating the work of securing by gifts, exchange, and purchase, British books, journals, etc., for students, professors, and libraries in the universities of Central Europe. Donations of books, periodicals, and money will be gratefully received by Mr. B. M. Headicar, Universities' Library and Student Relief for Europe, London School of Economics, Houghton Street, London, W.C.2.

H.M. STATIONERY OFFICE has printed a Consolidated List of Parliamentary and Stationery Office Publications issued from January 1st to May 31st, 1922. In it the net price and the price with postage are both given. Publications issued by the Stationery Office can be obtained through any bookseller, but a bookseller is not always disposed to obtain a copy of one of the shorter papers published at the price of a few pence; it may often be convenient to obtain such a paper by writing to the Stationery Office. Its addresses are Imperial House, Kingsway, London, W.C.2, and 28, Abingdon Street, London, S.W.1; 37, Peter Street, Manchester; 1, St. Andrew's Crescent, Cardiff; and 23, Forth Street, Edinburgh.

THE 50th anniversary of the Society of Serbian Medical Practitioners will be celebrated at the University of Belgrade on September 21st. On the morning of that day there will be a solemn commemoration of medical men who died in the discharge of their duty during the war, followed by an address by the vice-president and an historical statement of the development of the society by the secretary. Afterwards addresses will be delivered by delegates. In the afternoon visits will be paid to various public health institutions in Belgrade, and in the evening a banquet will be held.

PROFESSOR WEIL, who gave his name to the Weil-Felix reaction, has recently died from typhus, which he contracted during his experiments on the disease.

LECTURES on "Health of the Mind and Body—How to Obtain and Preserve it," are being delivered by members of the Medical Council of the People's League of Health at Wormwood Scrubs, Wandsworth, Pentonville, and Holloway Prisons, London. The work has the sanction of the Home Office, and will be extended during the coming autumn and winter to all prisons throughout the country.

THE new Darling Building in the Medical School of Adelaide University, South Australia, was opened recently by Sir George Murray. It is to be devoted to the departments of the fundamental sciences in the faculty of medicine, as there has been inadequate accommodation for the teaching of anatomy, physiology, and pathology. The family of the late Mr. John Darling contributed £15,000 towards the erection of the building. In declaring it open Sir George Murray gave an account of the development of the medical school from the establishment of a lectureship in physiology down to the present extension of the school. The library of the Darling Building will accommodate the library of the South Australian Branch of the British Medical Association, as well as the medical library of the university.

THE courses in the Harvard School of Tropical Medicine, Boston, U.S.A., will begin on September 25th and continue until June 1st, 1923. The courses are open to graduates from recognized medical schools. Properly qualified students (not necessarily graduates of medicine) are admitted to single courses or to any number of courses which they may select from the various subjects offered. The school aims at giving an adequate preparation to those who intend to practise medicine where tropical or exotic diseases may be prevalent or occasionally encountered, to pursue original investigations in relation to exotic disease, and to organize prophylactic measures against infectious diseases. Candidates who are graduates of medical schools of recognized standing, and who have completed the full course in tropical medicine, have passed the required examinations, and have also complied with all other requirements, will be given a diploma in tropical medicine. Applications for admission to the school should be made to the director.

THE first annual balance-sheet of the Barking Hospitals' Welfare Fund shows the excellent results that may be attained by a well-organized system of collecting a penny a week from house to house in aid of the voluntary hospitals. Barking has some 31,000 inhabitants, mainly of the working classes, and its Welfare Fund amounts to over £1,283; of this, £400 has been allocated to the London Hospital, £275 to Poplar Hospital, £100 to St. Bartholomew's, and the balance to eleven other hospitals in varying proportions.

THE Government of Czecho-Slovakia has decided that patients proceeding to Pistany shall, on production of a doctor's certificate, pay half the usual fee for a passport visa.

THE Star and Garter Home for Disabled Sailors and Soldiers, which was established by the British Red Cross Society, and has hitherto been managed by a committee of that society, has recently been constituted an independent charity under a scheme prepared by the Charity Commissioners on the application of the society. It will be administered by a body of governors comprising the former members of the Star and Garter Committee, with the Hon. Sir Arthur Stanley as chairman and Sir William H. Bennett as vice-chairman. The appointment of additional governors is vested in the British Red Cross Society. Field-Marshal Lord Grenfell, Lord Leverhulme, the Mayors of Richmond (Surrey) and Folkestone, and the Chairman of the Sandgate Urban District Council have consented to become vice-presidents.

IT is announced that Engineer Vice-Admiral Sir George Goodwin, K.C.B., late Engineer-in-Chief of the Fleet, and Dr. James Colquhoun Irvine, C.B.E., F.R.S., Principal of St. Andrews University (formerly Professor of Chemi-try, Glasgow), have been appointed members of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research.

THE *Sphinx* has published a special tourist number, entitled *Egypt*, in anticipation of the Cairo season of 1922–23. Among the articles it contains is one recommending the country as the world's winter playground. Dr. Gerald Garry contributes another on Egypt as a health resort, and this, as well as other articles on various aspects of life in Egypt and the Sudan, are copiously illustrated. Copies can be obtained on application to the Secretary of the Egypt Promotion Association, Post Box 930, Cairo, or to tourist agencies in this country.

THE Board of Trade has received a notice of complaint that "acid acetic 80 per cent. grade or higher" has been improperly excluded from the lists of articles chargeable with duty under Part I of the Safeguarding of Industries Act. Any person directly interested should communicate with the Assistant Secretary, Board of Trade (Industries and Manufactures Department), Great George Street, London, S.W.1.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

"ALPHA" asks if it would be beneficial and safe for a child of 4 years to sleep in an open-air shelter, about 1,000 feet above sea level, in a Derbyshire district. The atmosphere is at times very foggy and cold during autumn and winter. The child is suffering from tuberculous glands, which have been twice operated upon, and has benefited by open-air treatment in the daytime during the summer.

DR. J. R. BARRISKILL (Sydney) writes, in reply to "Baffled" (April 15th, p. 629), to suggest that if the patient gives up smoking and takes a small dose of a saline laxative in half a tumbler of cold water the foul breath will cease to trouble him.

TREATMENT OF GALACTORRHOEA.

"X." asks for advice as to the treatment of galactorrhoea in a woman aged 24, with one child born twelve months ago. Belladonna, purgation, and dry diet, as well as binding the breasts tightly, have been tried with no marked effect. The quantity of milk varies from 2 to 4 pints a day, sometimes more. Treatment reduces the quantity to half only.

INQUESTS IN WORKHOUSES IN IRELAND.

"R. G. M." asks if a medical officer in charge of a hospital who is notified by the coroner to give medical evidence as to the cause of death at an inquest (in the case of a man killed in an accident and brought dead to the hospital) is entitled to a fee.

*** We are informed that the medical officer of a workhouse hospital in Ireland is not entitled to a fee for inquests held on bodies placed in any part of the workhouse buildings—even when the dead body is brought in from outside for convenience in holding the inquest.

WARTS OF THE SCALP.

DR. JOHN A. FRANCIS (London) writes to suggest that "X. Y. Z." (August 5th, p. 240) might try the following mixture:

℞ Magnes. carb. lev.	... ...	ʒiij
Pulv. tragac. co.	... ...	ʒss
Aq. chlor.	... ...	ad ʒviij

ʒj three times a day.

He says that in one case of a man with an uncountable number of warts on the scalp, and in a case of a young woman with the same condition on the face, the warts all disappeared in a few days. The treatment does not seem to have any effect on the ordinary warts on the hand.

INCOME TAX.

"R. W. S." is a partner in a practice in connexion with which a house is occupied of which five rooms are used for the practice and only two bedrooms, the kitchen, and part of one of the five "professional" rooms are used for private purposes. He asks whether he can claim two-thirds of the rent, rates, etc.

*** Yes; two-thirds would seem to be a reasonable proportion in the circumstances. The authorities usually refuse any additional claim based on the ground that the house is more expensive than would normally be required, and there is no clear justification for including any *special* charge on that account. "R. W. S." might, however, put forward the argument that the cost of the professional portion is not less than three-quarters of the total amount paid. In such a claim as this everything turns on the actual circumstances of each case.

"L. D. P." holds an appointment in Government service abroad. He proposes to spend eight months in this country from March 25th, 1923. What income-tax will he be liable for in this country?

*** It is assumed that "L. D. P." does not maintain a residence in this country during his absence abroad, and that the present rates of tax will remain in force for 1922-23. The tax payable would be as follows:

Amount of pay in United Kingdom between April 5th, 1923, and date of departure (say)			£700
Deduct—Earned income allowance	£70		
Personal (married) allowance	£225		
Child allowance	£36		
Dependent relative (say half—*i.e.*, proportion—of £25)	£12 10 0		
		£343 10 0	
		£356 10 0	
Of which £225 at 2s. 6d. in £ =	£28 2 6		
And balance £131 10s. at 5s. in £ =	£32 17 6		
		£61 0 0	

"T. N. R." bought a secondhand car in 1921 for £140, and sold it in July, 1922, for £90, buying a new light car for £275.

*** The allowable expense is £140—£90—that is, £50; the additional expenditure actually incurred represents capital outlay in improving the equipment of the practice. It should be understood that the expense is taken into account in computing the year's profits, and not deductible in one sum from the average profits of the previous three years.

LETTERS, NOTES, ETC.

Estimation of the Toxicity of Organic Arsenic Compounds.

DR. W. R. G. ATKINS (Marine Biological Laboratory, Plymouth) writes with reference to the difference in toxicity of different batches of the same organic compound of arsenic, which has made it necessary to test the toxicity of each fresh sample by injections, to suggest that since the compounds in question are hydrochlorides of weak bases or sodium salts of weak acids, it may be possible to differentiate between pure preparations and those either originally impure or which have become so through oxidation, by determining the hydrogen ion concentrations colorimetrically. These determinations may be made with rapidity by adding a few drops of a suitable indicator. The results might be correlated with those afforded by the more tedious and costly toxicity tests. The hydrochlorides are customarily neutralized with sodium bicarbonate before injection, but it may be remarked that if subsequently sterilized by boiling, the loss of carbonic acid may result in producing a reaction considerably more alkaline than that of the body (about pH 7.4). In this connexion the results of Williams and Swett (*Proc. Soc. Expt. Biol. and Med.*, 1922, 19, No. 6, 266-268) are of interest. These workers found that several preparations of salvarsan when prepared according to the directions of the manufacturers, ranged from pH 11.53 to 11.99. Silver-salvarsan, pH 10.71; neo-salvarsan pH 8.55 to 9.22. Solutions of glucose were found to be markedly acid, being under pH 5, and normal saline varied from pH 6.4 to 4.95, and it is recommended that they should be brought more nearly to the reaction of the blood by adding mono- and di-potassium phosphates. Williams and Swett state their belief that the difference in the pH value of the injection and the blood is the main cause of sore arms following subcutaneous injections.

Bathroom Dangers.

DR. A. LAPTHORN SMITH writes: In the aggregate many valuable lives have been lost by accidents similar to that which caused the death of the late Sir Arthur Pearson. A leading lay journal has asked whether the medical profession cannot offer some suggestion by which this accident might be prevented. What probably happens in most, if not all, the cases is as follows: The bath is filled with very hot water and the person steps into it, not counting that the bottom is concave and very slippery, so that as soon as his full weight rests on the bottom of the bath it slips from under him and he falls, striking the head on the taps at one end, or on the solid rim of the bath at the other. This stuns him for a few seconds, during which he slides down in the bath and is completely covered, and while in this helpless condition is quickly drowned. Many bathrooms are fitted with an electric bell on purpose to call for help, but naturally this is of no use in such a case. The accident can, however, be prevented by a simple and inexpensive appliance which I have fitted to my own bath—namely, a strong steel hook screwed firmly into a beam in the ceiling immediately over the centre of the bath, from which is suspended a strong piece of rope knotted at the lower end. One soon becomes accustomed to seize this rope firmly in the hand, so that the bather can swing himself into the bath quite independently of his footing on the slippery bottom. It would certainly render impossible such regrettable accidents as caused the death of Sir Arthur Pearson and many other well-known and useful people. Another cause of danger to which I think the profession should call the attention of patients is the extremely high temperature at which they, especially women, have accustomed themselves to take their bath. This high temperature draws an enormous amount of blood away from the head and towards the skin. This may result in a fainting spell, and as the water is ofttimes much deeper than is necessary the person is easily drowned.

"The Cold-water Doctor."

DR. C. JOYCE (Pinjarra, W. Australia) writes: I was delighted to see the letter by Dr. Thos. Carruthers in your issue of May 13th, p. 786, and to know that others have seen the folly of attempting to administer nourishment which is not assimilated in acute febrile disease. About twenty years ago I began withholding all food in the acute gastro-enteritis of infants. The wonderful success of the plan led me to stop food in any other condition where the digestive function is in complete abeyance. I have been in charge of the Government hospital of seven beds at Pinjarra for nine years. During that time all cases of acute febrile disease have been allowed no food but lemon and orange juice, and are encouraged to drink plentifully of cold water until the appetite returns, which is synchronous with the return to a normal temperature. The results in pneumonia are comparable to the results in diphtheria before and since the introduction of antitoxin: having unfortunately had considerable experience of diphtheria before that happy day, I realize the magnitude of the statement. Until 1918 I had not the opportunity to try the plan extensively in influenza, but I had the unique experience of finding every patient make a complete recovery in that epidemic. I had taken the precaution of warning the public through the medium of the local paper, advising everyone who felt ill to drink water only *plus* a good dose of Epsom salts; consequently all my patients had water only from the inception of the disease. I fully appreciate Dr. Carruthers's remarks about the difficulty of getting the profession to break away from textbook tradition.

Continuous Oxygen Apparatus.

DR. FREDERIC VICARS (Wimbledon) writes: The apparatus described by Dr. Geoffrey Bourne in your issue of July 8th (p. 40) is only an elaboration of a simpler one invented some years ago by my friend the late Dr. George Stoker. This consists of a rubber bag with a capacity of one cubic foot. Attached to it is a rubber tube, and at the further end of the tube is an ordinary rubber teat. The bag is filled with equal parts of oxygen from a gas cylinder and of air introduced by an ordinary spray bellows. The teat is fitted into one nostril and held there by a piece of tape passing over the ears and tied behind the head. The other nostril is plugged with cotton-wool. The bag of diluted oxygen (50 per cent.) gradually collapses under the pressure of a light weight placed upon it. When empty it is refilled as often as necessary. The apparatus is very simple and the results attending its use are very satisfactory. It can be obtained from the original maker—Fellows, chemist, Hertford Street, Mayfair.

Radiotherapy.

MR. H. FLECKER, F.R.C.S. (Melbourne), writes to express his disagreement with a statement in a paragraph published in the BRITISH MEDICAL JOURNAL of May 13th, 1922, p. 776. It gave the substance of a notice with regard to the early treatment of cancer, issued by Dr. C. K. Millard, M.O.H. Leicester. It was said that treatment by radium or *x* rays, though hopeful, is still in the experimental stage, and that "although many alleged 'cures' have been announced, there are none which have so far substantiated the claims made for them." Mr. Flecker is of opinion that no worker who has had actual experience of, or who has actually witnessed, the work done by various radiologists working with high-tension currents of about 200,000 volts, will fail to admit a vast improvement in the results as compared with older methods.

A Class-conscious Conscience.

A CORRESPONDENT tells us that a conscientious objector submitted the following grounds for obtaining exemption of his child from vaccination in a district not far distant from London: "Vaccination is a trick of the capitalist to get the workers' children innoculated so that their brain will not develop so that they will remain serfs."

Vacancies.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 31, 34, 35, 36, and 37 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 32, 33, and 34.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *108*.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£ s. d.
Six lines and under	0 9 0
Each additional line	0 1 6
Whole single column (three columns to page)	7 10 0
Half single column	3 15 0
Half page	10 0 0
Whole page	20 0 0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.